

The United States MILLER

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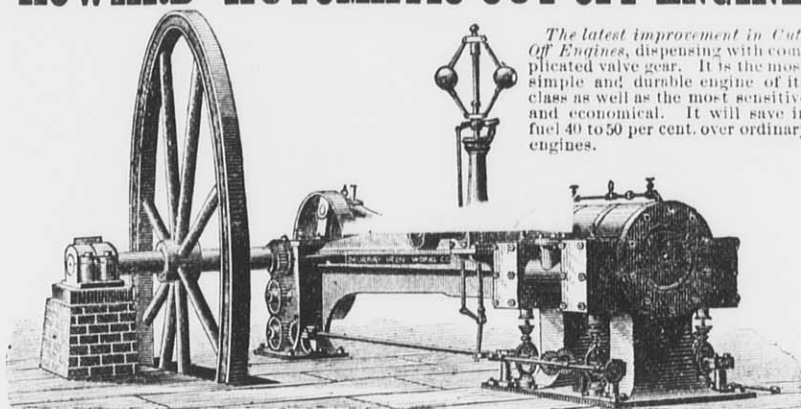
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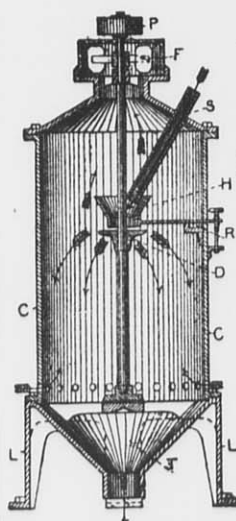


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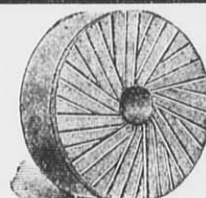
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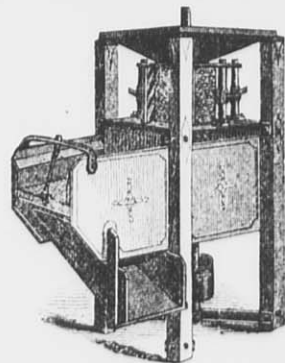
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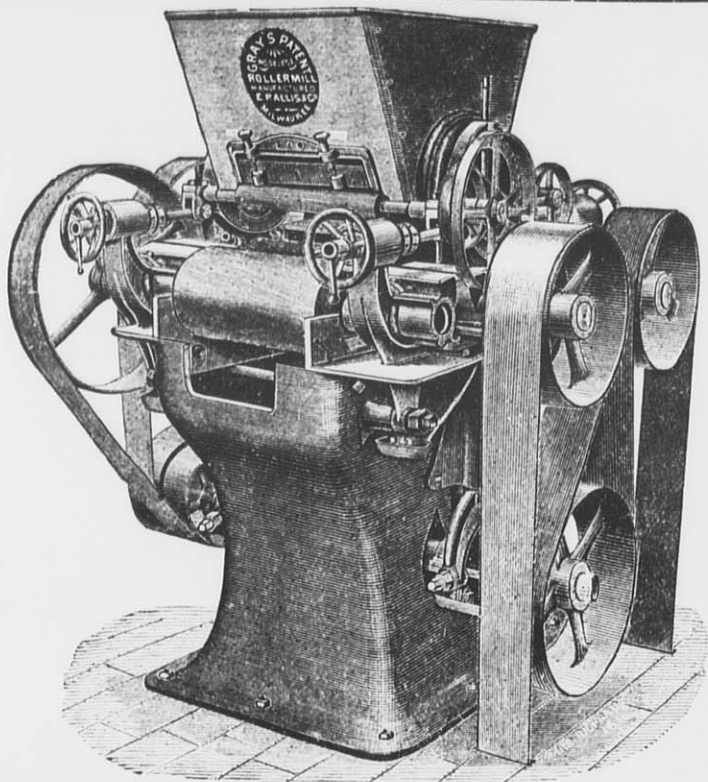
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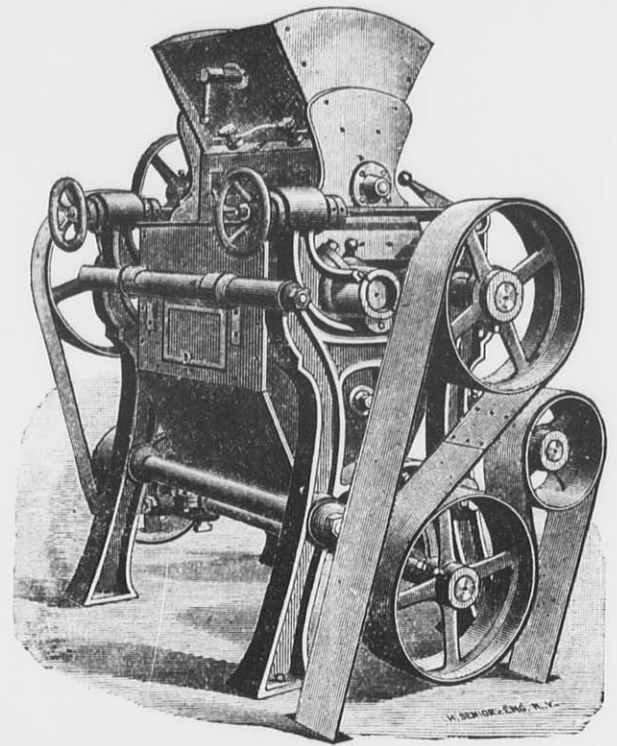
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MILWAUKEE, WIS.

The United States MILLER

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MILWAUKEE, FEBRUARY, 1882.

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Total Destruction of the Deptford Bridge Flour Mill, London.

We regret to have to report the total destruction by fire of the Deptford Bridge Flour Mill, Greenwich, the property of Messrs. J. & H. Robinson.

The mill was built in 1870, and was one of the handsomest structures of the kind in the metropolis, its extreme length being 92 feet, with a width of 66 feet, a height to the eaves of 56 feet, and to the apex of the roof of 76 feet. The building was composed of seven stories, the two first from floor to floor being 10 feet, and the others 9 feet respectively. The floors were supported on cast iron columns, 9 in. in diameter, and strong timber beams, which in the granary division were strengthened by trussed wrought-iron girders firmly fastened into the side walls. The building was in two divisions, that to the west being the mill proper, the eastern portion constituting the granary. The two were divided by a strong brick wall, through which access was found by means of double iron doors, and the wheat cleaning department, which occupied two floors of the building, was isolated from the mill and the granary by similar means. In short, the greatest care had been exercised in constructing the building with the view of minimizing the risk from fire, to which it has ultimately succumbed.

At about half past five o'clock a. m., Dec. 22, 1881, when the day shift was about entering upon its duties, a fire was discovered in the third floor of the mill. An effort was made to extinguish it by means of buckets of water, and the use of a hose attached to a hydrant on the premises. The flames, however, had made such headway that the effort was unsuccessful, more especially as the hose burst, and the men had to leave the building for their lives. A messenger was at once sent to the local fire brigade station, and in a few minutes the steamer attached to it was on the spot playing upon the burning building. In the meantime telegraphic calls had been made at other stations, and thirteen steamers were eventually and early at work with the view of extinguishing the conflagration. Owing to its being low tide, the river steam engines could not get up the creek on which the mill stands;

but as there was an abundant supply of water from the creek and the water company's mains, all was done that possibly could be effected by the means at the disposal of the fire brigade. Unfortunately, however, all was in vain, and about 7 a. m. the roof of the mill fell in with a tremendous crash, and in two hours from the discovery of the fire the mill was entirely gutted. Soon after the falling in of the roof, the flames communicated with the upper floors of the granary, three of which were destroyed at an early hour, and although the engines continued during the day and night to play upon the granary, it also was ultimately destroyed. The cause of the fire is supposed to have been the firing of a pair of mill-stones running without feed, the flame developed by the friction communicating with the exhaust trunk. Two pairs of stone only were working into this trunk, the other seven pairs in operation at the time

working with Seck's Exhaust. At the time of the fire a portion of the mill was being fitted with Gray's Gradual Reduction System, and the valuable machinery connected with this, which had been put in position, including two sets of rollers, six G. T. Smith middlings purifiers, &c., together with eleven sets of other roller mills, all the flour dressing and wheat cleaning machinery were entirely destroyed. Fortunately the engines and boiler, located in a separate building, escaped without injury, except by water. The loss to the firm is very large, but it is insured in the Millers' Mutual, Millers' and General, The Equitable, The Standard, and the Hand-in-Hand Fire Insurance Offices.

Great sympathy is felt by the trade for the

tor. If iron or porcelain rollers are used, it is necessary that these should be covered in from the air, so that the flour dust does not spread outside. The same observation applies to the bran dusters, bolting reels, detachours and certain purifiers. The greatest cleanliness and order should be observed in a mill; dust should not be allowed to accumulate on the machines, nor the sweepings in the corners. If these instructions are observed there will be but little dust in the air and less chances of explosion. In many mills considerable quantities of wheat are ground without separating the bran, which is thrown aside in a heap; in such cases it is forgotten that

ITEMS OF INTEREST.

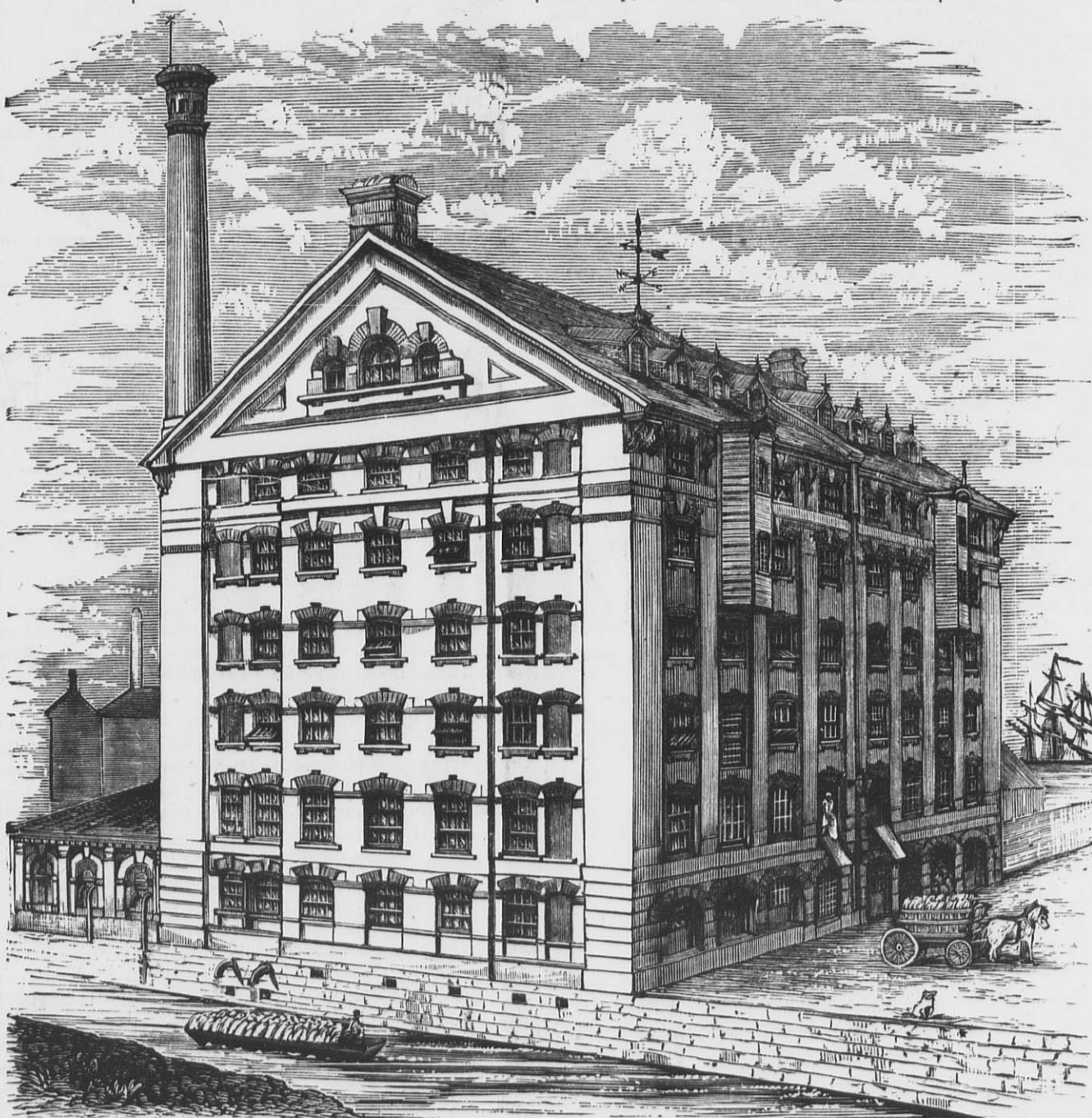
COL. JAMES H. REDFELD was somewhat taken by surprise Saturday morning when there came by express a new suit of clothes worth about sixty dollars, a Christmas gift from the Ewing Mill Company, of Ewing, Jackson County, for whom he built and furnished a large new mill the past summer. It is a very flattering compliment to Mr. Redfield and shows how well pleased are the parties for whom he superintended the work.—*Salem (Ind.) Democrat.*

WHERE THE GLUCOSE GOES.—The *Boston Journal of Chemistry* thus accounts for the disposition of the millions of pounds of glucose manufactured in the western states every month. It is used mostly as an adulterant to the manufacture of table syrups and in adulterating the dark, moist sugars used largely by the poor. Its next largest use is in the manufacture of candies. All soft candies, waxes, taffies, caramels, chocolates, etc., are made of glucose. Children are, therefore, large consumers of the substance; the honeybees are also fond of it and will carry it away by the ton if it is placed within their reach. The honey made from it is no better than the pure glucose, as it is stowed away in the cell without change. Human ingenuity, it is said, has reached the point of making honey and storing it in the comb without the intervention of the bee. By appropriate machinery a nice looking comb is made out of paraffine, and after the cells are filled with glucose syrup this fictitious "honey" is warranted true white clover honey from Vermont.

The *London Times* prints an interesting letter from its Philadelphia correspondent, who writes that there has come gradually stealing over the American people a vague impression that the period of prosperity is approaching an end. He says that they feel that it is so; they cannot tell why, and hope it will not be. But they point to recent bank and other failures as indicating that speculation has produced undue inflation and the customary accompaniments of bad defalcations. They also point

to the very high prices prevailing for almost everything—especially food—short harvests and unemployed immigrants, as signs that a turning point must soon be reached, and with the downward turn, an abatement of prosperity. The feeling of evil is apprehensive, and not produced by present actual experiences beyond the high food prices. Trade is good, and the railroads can hardly carry the traffic offering, though the return is not very remunerative. That the United States will succumb or wince under one bad harvest is not, of course, for a moment to be supposed; but the fear is, that the vast artificial accumulation of high prices, and the speculation resting on this inflation may, with an adverse turn, produce a partial relapse.

Merrill & McCourtie, owners of several mills in Kalamazoo, Mich., and vicinity, have dissolved partnership. The name of the firm continuing business is D. B. Merrill & Co.



THE DEPTFORD BRIDGE MILL, LONDON, J. & H. ROBINSON, PROPRIETORS, BURNED DEC. 22, 1881.

loss that the Messrs. Robinson have sustained.—*The Miller*, (London).

The *Miller's Gazette and Corn Trade Journal* estimates the loss at \$175,000.

Fires in Flour-Mills.

Mr. P. Kramer, in writing on the above subject for *Die Muehle*, says in regard to fires caused by explosions:

To diminish the chances of explosion it is recommended to hermetically close all machines in which the flour is rapidly moved about, such as bolters, mixers and certain purifiers. If a miller work with stones it is necessary that they should always be kept fed, for besides the injurious effect of running empty stones, the friction of the stones produces sparks, which may easily lead to fire in the aspira-

bran absorbs dust, and might very easily give rise to an explosion. When the bran is gathered together to be re-ground, care should be taken to accumulate it in a closed chamber, or better still, by sacking. Bran heaped up in a mill might in a very short time become heated and take fire spontaneously. A fire taking hold under such circumstances is all the more difficult to check as it cannot be easily quenched with water. In spite of all precautions, however, there will always be dust in flour mills, which is not only injurious to the health of the workmen, who so often contract throat diseases, but it is always dangerous from the fire point of view,

Collins & Co. succeed A. N. D. Butz, Jr., in the milling business at Liberty, Ill.

UNITED STATES MILLER.

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MILWAUKEE, FEBRUARY, 1882.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year.

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MOST MILLERS of late have had plenty of time to read the papers and think about "fixing up" so as to be ready for lively work when the next harvest comes in.

WHERE, O where is that new Iowa milling paper? Perhaps 'tis born to blush unseen, or to waste its fragrance on the Hawkeye air", or words to that effect.

WE CALL the attention of our readers to the new advertisement of Rumsey & Co., Seneca Falls, N. Y., manufacturers of steam pumps and fire engines and apparatus.

MESSRS. POOLE AND HUNT of Baltimore, Md., report business booming down in Maryland. They are running a very large force on full time. See their advertisement on another page.

SMITH BROS., the well known firm of millwrights, are commencing the erection of a large new shop on the East Side in order, to be able to keep up with the ever growing demands of their business.

MR. BIRKHOLZ's articles will again begin to appear in our March number. Mr. Birkholz has been so busily engaged during the past two months in perfecting some of his inventions that he has been unable to furnish us with his usual contributions which are so eagerly looked for.

WE HAVE been favored with the annual reports of the Millers National Insurance Co., the Illinois Mutual Insurance Co. and the Western Manufacturers Mutual Insurance Co. in all of which companies many millers are interested. From the figures given we should judge that all of the companies named are doing a prosperous and paying business.

GEORGE G. SMITH, the well known Milwaukee mill builder is now doing a flourishing business at 114 Mission street, San Francisco, Cal. He takes contracts for building mills anywhere on the Pacific slope. He is also the western agent for all kinds of flour mill machinery. Millers of the Pacific coast have an able assistant in Mr. Smith in developing their special industry.

Our Visitors.

During the month of January the UNITED STATES MILLER was favored with calls from the following gentlemen connected with the trade: C. M. Gilbert, representing the Richmond Manufacturing Co. of Lockport, N. Y.; S. H. Seamans, Secretary of the Millers National Association; J. E. Loomis, St. Louis, Mo., the general western representative of the Electric Purifier Co. of New York; A. Zinn, Secretary of the Nunnemacher Milling Co.; L. R. Hurd, Manager of the Davis Roller Mills; L. E. Mann, Madison, Wis., representative of the George T. Smith Middlings Purifier Co.; R. Birkholz, mill-engineer with Edw. P. Allis & Co.

A Mammoth Malt House.

The Ph. Best Brewing Co., of Milwaukee, are now preparing the plans for a new malt house to be built in this city during the present year which will be one of the very largest in America. The building will be 100 feet wide by 225 feet in length and nine stories in height. It will be capable of storing and handling over 500,000 bushels. Its cost will be from \$250,000 to \$300,000 exclusive of the value of the ground, on which it will stand. The Company now has a malt house with a capacity of 400,000 bushels, and the necessities of the rapidly increasing business demands the additional malt house as soon as it can be built. The present out turn of the Ph. Best Brewing Co.'s plant is 500,000 barrels of beer per annum.

E. Hayward Noye.

It is our sad duty to record the death of E. Hayward Noye, junior, member of the well known firm of John T. Noye & Sons. He was thirty-four years of age. He leaves a family consisting of wife and one child. The numerous friends in all parts of the country, which this whole souled young man had made, will sincerely mourn his loss and sympathize with his bereaved family.

AT A MEETING of the employees of Noye & Sons, the following resolutions were adopted:

Whereas, In His inscrutable wisdom it has seemed good to the Almighty Ruler of the Universe to remove from our midst our friend and employer, E. Hayward Noye; and
Whereas, We desire to give expression to our thorough recognition of his unwavering courtesy and kindly interest in our welfare while in life; therefore,
Resolved, That in his decease we are bereft of one whom we loved as a friend as well as employer.
Resolved, That our heartfelt sympathy is hereby tendered to his bereaved wife and brother in this hour of deep affliction.

Resolved, That in mingling our tears and expressions of grief, at his untimely demise, with those of his family, we sincerely believe, that their loss is his eternal gain.

Resolved, That a copy of these resolutions be sent to his family and brothers, and to each of the city papers for publication.

IRA WESCOTT,
J. S. KARNES,
S. R. CAMPBELL,
Committee.

Piper, Gibbs & Co., owners of the water-power and mills at Pipersville, Wis., were sued for damage on account of overflowage last spring. The case came on for trial at Watertown January 29, and the jury rendered a verdict in favor of the defendants. Messrs. Piper, Gibbs & Co. are to be congratulated.

Agriculture in Austria-Hungary.

The American competition is being felt severely in other countries besides our own. The last volume of consular returns issued contains a remarkable paper by Consul Faber on the trade and commerce of Fiume, in which he gives a very gloomy account of agricultural affairs and of the results of the American competition throughout Austria-Hungary. The first part of his report deals with the serious decline in the exports of Hungary in consequence of the deficient crops last year—a decrease amounting in value to no less than 3,318,696 florins in the total value. On ten of the principal articles of export, and which include grain, flour, bran, and beech timber, there is a decrease of 5,482,708 florins; but this is partly compensated by an increase in eleven other articles, which include wine, sugar, charcoal and mineral waters. The chief decrease is in flour, of which article only 50,808 tons were shipped from Fiume in 1880-81, as against 69,748 in 1879-80. This is a serious decrease of 27 per cent. That this decrease is more or less general, so far as Hungarian flour is concerned, is shown by the tables of exports via Hamburg and Bremen, via Trieste, and via Fiume—in each case to Great Britain alone; the decrease on the year being 8 per cent. in the former case, 11 per cent. in the second case, and 27 per cent. in the latter case. In all, 71,000,000 kilogrammes were exported last year, as against 88,596,000 kilogrammes in 1879-80. Of this quantity 48,500 tons were shipped by the Buda-Pesth mills, or a decrease of 30 per cent. "This quantity," we are told, "represents only 27 per cent. of the total produce of numbers '0-6,' the proportions being 60 or 70 per cent. of the total produce of '0-3,' which are the qualities of flour for which the preponderance of Hungary in the English markets yet remains uncontested by America." The entire product of the Buda-Pesth mills, Mr. Faber points out, was for the year 1880 only 358,000 tons, as against 430,000 tons in 1879. We thus see a decrease on all sides, and one which cannot be fully accounted for by a deficient crop in Hungary; for if the circumstances of the case be taken into consideration, we see that in any case, whether the harvest be good or bad, 50 per cent. of the produce of the Hungarian mills consists of high-class flours, whose sale mainly depends upon the demand for exportation, and on looking further into the matter, it is declared that it will be found that the chief obstacles Hungary has to contend with in this respect are the American competition and the prohibitive and protective duties in Germany.

The American competition is being felt severely in the English and Dutch markets—in England alone it has risen from 700,000 barrels in 1877 to 3,000,000 barrels in 1879, and although Hungary has a monopoly for the finest qualities of flour, yet the quantities of American flour thrown upon the English markets and the consequent difference of price in favor of American flour, which amounts to as much as 2s. to 3s. per sack, cannot fail to tell in the end, even on those qualities of flour which are and probably will remain the specialite of the Hungarian mills. Owing to the new import duty of 2 marks per 100 kilos, the exports to Germany have ceased altogether, and Mr. Faber points out here that although Germany has by protective duties tried to foster its own mills, this has not been the case. Instead of flourishing, they have declined, and American competition has here also exerted an influence which has almost entirely killed the export trade. In 1879 over 200,000 tons of flour were exported, and in 1880 less than half that amount.

Having thus shown the great decrease in the production, agriculturally, of Hungary, Mr. Faber proceeds to point out that the country is suffering from the occurrence of a succession of bad harvests, heavy taxation, usury, under which the peasantry are suffering, enforced military service, and absentee landlordism. These causes are all at work, intending fast to impoverish the country. Of the future, the Consul says: "A succession of good harvests might do a good deal to remedy these evils for the time being, but even then there is the American competition to deal with, and to meet which is becoming a matter of existence to Hungary. The American competition can only be met by a general improvement of agriculture, on a systematic instead of an arbitrary system, such as now prevails, and by adopting a rational policy of railway tariffs, regardless of such considerations as centralization, which may yet prove the ruin of Hungary as an agricultural State."—British Mail.

Oil.

There are various methods by which the manufacturer can protect himself against the foisting of impure, diluted and mixed oils upon him in lieu of the genuine article. The simplest manner is, probably, to have at hand some of the many well known methods for the detection of the adulteration and educating himself in the use of them. Persons thoroughly experienced in the handling of oils can test satisfactorily by taste or smell, and very readily, by heating, in the latter manner, the odor being more strongly produced by heat. There are, of course, many methods open to an analytical chemist by which to arrive at its absolute purity, such as by the addition of chemicals to produce reaction, etc.; but the most simple and practicable for every day use, if not absolutely perfect in its definition, is by the assistance of the densimeter, the use of which is the preliminary step in chemical analysis. This instrument is a glass cylinder, about one inch in circumference and from 6 to 10 inches in length, having at one end a small bulb loaded with shot, and the other closely sealed; and by placing it in the oil to be tested, it floats the heavy end downward and sinks to a depth that the figures on the stem determine the specific gravity of the oil, which, of course is in proportion to its density. In this manner an exactly measured quantity is weighed; and having been previously provided with a similar quantity of standard oil of known purity, nothing remains but a comparison, care being taken that both oils are of the same temperature, to determine readily the quality and value of the oil tested.

New Publications.

HARPER'S MAGAZINE for February, 1882. Published by Harper & Brothers, N. Y. Subscription price \$4.00 per year.

HARPER'S for February, contains for a full page frontispiece, a portrait of Victor Hugo. The following articles are profusely and finely illustrated: "A Clever Town, built by Quakers;" "French Political Leaders," by A. Bowman Blake; "The American Life Saving Service;" "The Wilson Industrial School and Mission," by Miss F. E. Tryatt; "Henry Irving at Home," by Joseph Hatten; "Mexico," by W. H. Bishop. This number also contains several select poems and the usual number of good things in "The Drawer."

THE CENTURY MAGAZINE. The Century Co., New York, Publishers. Subscription price, \$4.00 per year.

THE CENTURY MAGAZINE may now be considered fairly started on its way under the new name, and with the February (Midwinter) number, and the adoption of the new cover design, by Elihu Vedder, the name of Scribner's Monthly will no longer be continued as the sub-title. Since the change of the name there has been a decided increase in the sale of recent numbers of this magazine. The average edition during the last year of Scribner's Monthly was 120,000, while of the first four numbers of the CENTURY it has been more than 132,000. Of December, a new edition of 9,000 was printed, and a new edition of the January issue is now called for. In England, 20,500 copies were sold, against an average of 16,530 for the twelve months preceding. The recent growth of ST. NICHOLAS in England has been even greater in proportion; for while 3,000 copies were sufficient there a year ago, 8,000 and 10,000 copies are now needed every month.

COAL—A weekly journal devoted to the interests of the coal trade. Published by the Scientific Publishing Co., No. 27 Park Place, New York. Subscription price, \$2.00 per year.

This paper will be highly valued for the information it contains to dealers in coal in all parts of this country, to manufacturers who use considerable quantities of it, and to all interested in coal mining.

THE PAPER WORLD. Published by Clark W. Byran & Co., Holyoke, Mass. Monthly. Subscription price, \$2.00 per year.

THE PAPER WORLD is one of the handomest papers coming to our table, and is ably edited. It is of value to all interested in the trade, either as dealers or manufacturers. It is a credit to the trade it represents.

LIFE AND WORK OF GARFIELD.—We have heretofore referred to this remarkable book by Dr. John Clark Ridpath, published by Jones Brothers & Co., Chicago. Its success is almost phenomenal. It is doubtless having a larger sale than any other book now before the public. It seems to possess the rare quality of responding to the popular want in every detail—in matter, illustration, paper, printing, binding, and price. As it concerns Garfield's life and the events which makes him illustrious, this book will ever remain the standard popular biography.

The Howard Automatic Cut-off Engine

It is well known that the power imparted to the driving shaft of all high-pressure engines is variable. The aim of modern inventors has therefore been to produce such mechanical devices for this class of engines, as will most economically secure at all times a definite ratio between the duty performed by the engine and the supply of steam to the cylinder. Uniformity may be secured to some extent by allowing the steam to follow the piston head during as large a part of the stroke as possible; this it is obvious (and especially with a high piston speed) requires that the exhaust valves open freely before the completion of the stroke, and necessarily involves much waste of steam. By using steam expansively we reduce this waste to a minimum. The load to be driven by an engine is necessarily variable, and in most cases it is greatly so; while the boiler pressure is subject also to variation. In order, therefore, to obtain the best results from the engine using steam expansively, it is necessary to have a mechanical device that will secure quick motion of the valves without wear and tear, and which will correct the variation by maintaining at all times a uniformity of piston speed. The best method adopted thus far to obtain these results, is to so attach the governor to the movement of the receiving valve as to instantaneously cut-off the steam supply; the valves being opened by a positive motion and closed by the action of the governor.

We present in the accompanying engravings front and back views of the Howard Automatic Cut-off Engine, embodying the latest improvements in variable engines, by which the best economical results are obtained, while the simplicity and accessibility of its working parts secure a freedom from wear and tear hitherto unknown in this class of engines, and it is claimed makes the "Howard" a far more durable engine than the "Corliss" or any other of its compeers.

The speed of the engine is regulated by the fly ball governor, connected by lever and crank with a sliding bar, which imparts a sliding motion to the revolving cams; these cams are cut away spirally from the lead line at one end, to the point of full stroke on the other end; the point of full stroke being always directly under the valve stem, when the engine is at rest, and drawing from under the valve stem, with the motion of the governor, until the required point of cut-off is reached. This ranges from full stroke to zero, and in no way controls the lead, which remains the same at whatever point the engine may be cutting off.

The engine has four "grid" valves, giving large area of opening, in proportion to the amount of movement. The induction valves are on the same side with the crank shaft, the two exhaust valves on the opposite side. The mechanism for operating the valves is all on the outside of the steam chest; each valve has its own cams, works independently of the rest, and is in motion only during that part of the revolution in which it performs its proper duty—diminishing the wear of valve and seat to a minimum.

The valve seats have a projection on the wearing side, and being separate from the cylinder, are readily taken off for refitting.

The valve gearing is extremely simple, all the cams are hardened steel, and the yoke on valve stem carries a hardened steel roller, working on face of cam, for lifting the valves, which drop of their own weight, assisted by the pressure of steam.

Motion is imparted to the valve shaft through a train of gearing, which insures a positive movement.

The lower parts are on a line with the bottom of the cylinder, making a free passage for water in case the boiler foams. The practical results obtained from these engines have more than realized the expectations of the inventor and the builders.

The Murray Iron Works Co., of Burlington, Iowa, are putting in additional plant, in order to meet the demand. They are now negotiating with an Indianapolis firm to build for them an engine of 400 horse power for elevator purposes, and will be prepared to build them of any size required.

Messrs. Peters & Bernhard, millers of Ft. Madison, Iowa, make the following statement with regard to their 100 horse "Howard" which certainly shows remarkable performance of the engine:

"We are now running on less than half the fuel we used with our old engine, and on 40 lbs. less boiler pressure. The engine does not vary one revolution whether we carry 40 lbs. or 100 lbs. steam. With our old engine we required a fireman, and used six cords of pine wood to make 100 bbls. of flour. With

the "Howard" our engineer does his own firing and we use but three cords pine wood to make 100 bbls. flour. The engine will pay for itself in saving of fuel. We would not exchange it for any engine we ever saw or heard of."

N. R. Derby & Co., of Burlington, Iowa, have one of the "Howard" engines, which they say "will pay for itself in fuel saved in one year."

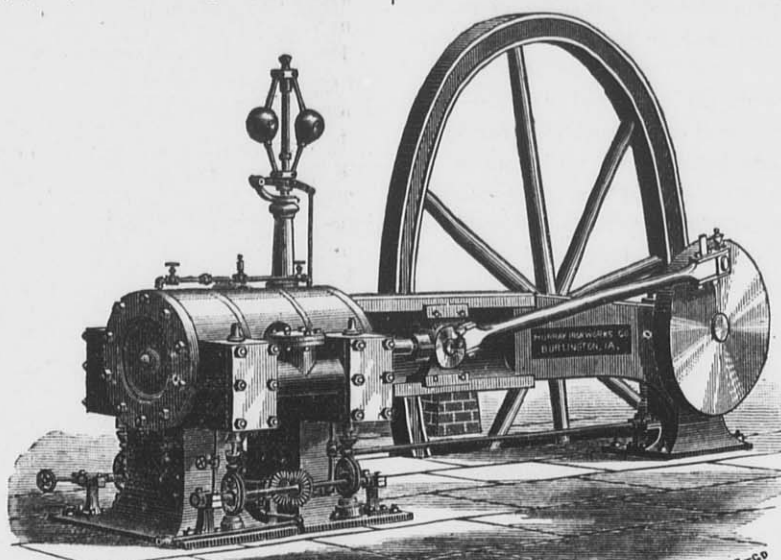
Breadstuffs in Germany.

Leonhard Simion, of Berlin, has just published a pamphlet on Germany's "Cereal production and its consumption of breadstuffs" on the basis of the average of 1878-1880 inclusive. During these three years it is shown that there were harvested in that country on an average 5,800,000 tons of rye, 4,400,000 tons of oats, 2,450,000 tons of wheat, 2,200,000 tons of barley, 4,500,000 tons of spelt, and 150,000

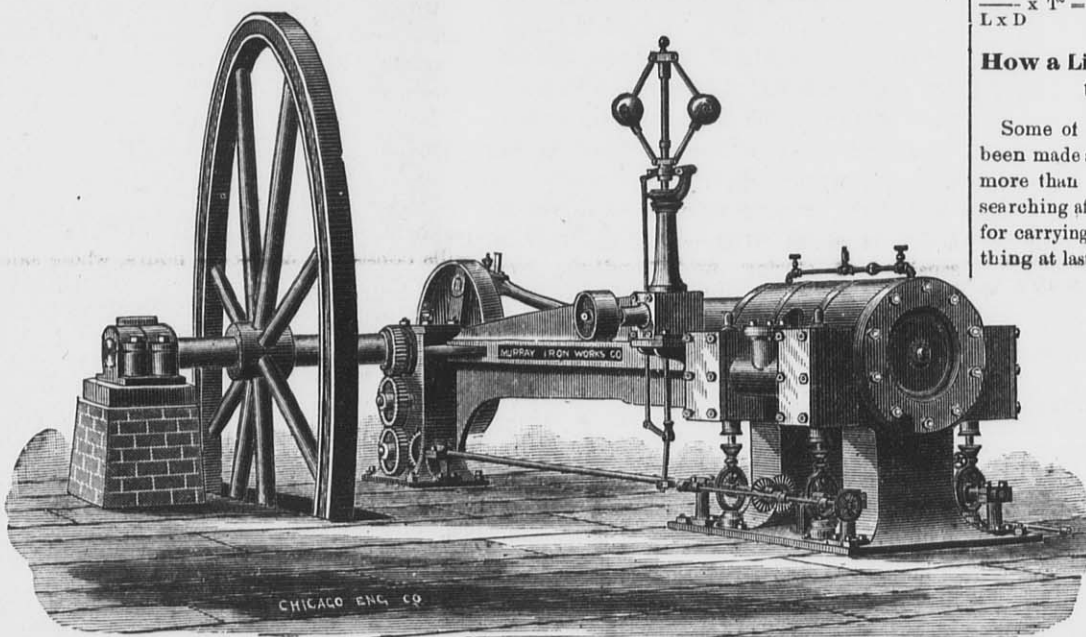
per capita would therefore more than suffice to cover the home demand.

Mr. Simion is, however, of opinion that this assumption would be erroneous, inasmuch as bread consumption is much greater in the agricultural and other rural districts than in the cities in Germany. The city population being, on the whole, better off than the peasantry in that country, the former consume more meat and fish than the latter and the villages. He thinks, that as to actual individual consumption, the garrisons, educational establishments, prisons and hospitals afford a better criterion. According to the statistics furnished from this source, it is shown that the average annual German consumption of breadstuffs may be safely estimated at 210 kilogs per capita, so that 44 3-10 kilogs. have to be imported in a year in which the domestic yield is equal to the average of 1878-80, i. e., 165 7-10 kilogs.

Estimating the population of Germany at



THE HOWARD AUTOMATIC CUT-OFF ENGINE—FRONT VIEW.



THE HOWARD AUTOMATIC CUT-OFF ENGINE—BACK VIEW.

tons of buckwheat. Deducting therefrom the amount of grain for seeding, there were available for the population of the country, 4,050,000 tons of rye, 3,600,000 tons of oats, 2,000,000 tons of wheat, 1,850,000 tons of barley, 490,000 tons of spelt, and 100,000 tons of buckwheat. In other words, per capita of the population, the average supply of domestic grain was of rye, 110 kilogs; of oats, 87; of wheat, 47; of barley, 42; of spelt, 8, and buckwheat, 3.

As food only wheat, spelt and rye are to be counted as of paramount importance, for barley is used in Germany chiefly for malting oats for horse feed, and buckwheat nearly all for fodder for cattle. From barley, large amounts of pearl barley are made and consumed in the country; from oats a good deal of oatmeal, and to some extent oats and barley are used for bread making. On the other hand, not inconsiderable quantities of wheat are converted into starch, and also used for brewing, while rye is extensively consumed for distilling purposes. Taking, therefore, wheat, spelt and rye, as material for bread making alone, and excluding therefrom barley, oats and buckwheat, it will be tolerably safe to put down the domestic breadstuff production of Germany for home use at 165 7-10 kilogs. per head on an average for three years, 1878-1880 inclusive.

The actual requirements of breadstuffs for food, taking the Prussian cities for a basis to go by, as shown from their town dues during the years 1847-73, may be computed at 47 7-10 kilogs. wheat, and 113 kilogs. rye, together 160 7-10 kilogs of breadstuffs per head. Judging from this Prussian city consumption, an annual domestic production of 165 7-10 kilogs

45,000,000 souls, there would consequently have to be imported in a normal crop year, 1,993,500 tons of breadstuffs, or, at 60 pounds per bushel, about 74,424,000 bushels—*Miller's Journal*, N. Y.

Formulas for United States Boiler Inspectors and Manufacturers.

The special committee, to which the duty of reporting rules for the determination of the working-pressure allowable, in order to guard against the collapsing of cylindrical riveted boiler-flues, reported to the board of the United States Steam Boiler Inspectors the following formulas for the guidance of inspectors and the information of boiler manufacturers:

The following formula shall be used by inspectors in determining the pressure to be allowed for riveted cylindrical flues of sixteen (16) inches and upward, viz:

$$\text{Let } \frac{1760}{D} = \text{a constant (C.)}$$

D = diameter of the flue in inches.
T = thickness of flue in decimals of an inch.

FORMULA.

$$\text{Constant } \frac{C \times T}{.31} = \text{lbs. pressure allowable.}$$

Example: Given a flue twenty (20) inches in diameter, and thirty seven one-hundredths (.37) of an inch in thickness. Required, pressure to be allowed by the inspector.

$$\frac{1760}{D} = \frac{1760}{20} = 88 = \text{constant (C.)}$$

$$\frac{C \times T}{.31} = \frac{88 \times .37}{.31} = 104 \text{ lbs. pressure allowable.}$$

For cylindrical flues of less than sixteen (16) inches in diameter, the following formula for determining the pressure to be allowed, shall be used by inspectors, viz:

$$\frac{1760}{D} = \text{a constant (C.)}$$

D = diameter of flue in inches, and T = thickness of flue in decimals of an inch.

FORMULA.

$$\text{Constant } \frac{C \times T}{.25} = \text{lbs. pressure to be allowed.}$$

Example: Given a flue ten (10) inches in diameter and twenty-two (22) inches in thickness. Required, pressure to be allowed by the inspectors.

$$\frac{1760}{D} = \frac{1760}{10} = 176 = \text{constant (C.)}$$

$$\frac{C \times T}{.25} = \frac{176 \times .22}{.25} = 155 \text{ plus lbs. pressure allowable.}$$

The following formulas shall be used by inspectors to determine the pressures allowable for cylindrical riveted flues used as furnaces, viz:

Let D = diameter of flue in inches.
T = thickness of flue in decimals of an inch.
L = length of flue in feet, (not to exceed eight (8) feet.
89600 = a constant.

FORMULA.

$$\frac{89600 \times T^2}{L \times D} = \text{pressure to be allowed.}$$

Example: Given a flue of forty (40) inches in diameter, seven (7) feet long, and five-tenths (.5) of an inch in thickness. Required, the pressure to be allowed by the inspectors.

$$\frac{89600 \times T^2}{L \times D} = \frac{89600 \times .25}{7 \times 40} = \frac{22400}{280} = 80 \text{ lbs. pressure.}$$

Provided, That if rings of wrought iron are fitted and riveted properly on, around, and to the flues, in such manner that the tensile strain on the rivets shall not exceed six thousand (6000) pounds per square inch of section, the distance between these rings shall be taken as the length (L) of the flue in the formula:

Example: Given a flue forty (40) inches in diameter, eight (8) feet long, and five-tenths ($\frac{5}{10}$) of an inch in thickness, having one ring at the middle of its length. Required, the pressure to be allowed by the inspectors.

$$\frac{89600 \times T^2}{L \times D} = \frac{89600 \times .25}{4 \times 40} = \frac{22400}{160} = 140 \text{ lbs pressure allowable.}$$

How a Little Girl Suggested the Invention of the Telescope.

Some of the most important discoveries have been made accidentally; and it has happened to more than one inventor, who had long been searching after some new combination or material for carrying out a pet idea, to hit upon the right thing at last by mere chance. A lucky instance of this kind was the discovery of the principle of the telescope.

Nearly three hundred years ago, there was living in the town of Middelburg, on the Island of Walcheren, in the Netherlands, a poor optician named Hans Lippersheim. One day, in the year 1608, he was working in his shop, his children helping him in various small ways, or romping about and amusing themselves with the tools and objects lying on his work-bench, when suddenly his little girl exclaimed:

"Oh, Papa! See how near the steeple comes!"

Half-startled by this announcement, the honest Hans looked up from his work, curious to know the cause of the child's amazement. Turning toward her, he saw that she was looking through two lenses, one held close to her eye, and the other at arm's length; and, calling his daughter to his side, he noticed that the eye-lens was plano-concave (or flat on one side and hollowed out on the other), while the one held at a distance was plano-convex (or flat on one side and bulging on the other). Then, taking the two glasses, he repeated his daughter's experiment, and soon discovered that she had chanced to hold the lenses apart at their exact focus, and this had produced the wonderful effect she had observed. His quick wit and skilled invention saw in this accident a wonderful discovery. He immediately set about making use of his new knowledge of lenses, and ere long he had fashioned a tube of pasteboard, in which he set the glasses at their exact focus.

This rough tube was the germ of that great instrument the telescope, to which modern science owes so much. And it was on Oct. 22, 1608, that Lippersheim sent to his government three telescopes made by himself, calling them "instruments by means of which to see at a distance."

Not long afterward another man, Jacob Adriaensz, or Metius, of Alkmaar, a town about twenty miles from Amsterdam, claimed to have discovered the principle of the telescope two years earlier than Hans Lippersheim; and it is generally acknowledged that to one of these two men belongs the honor of inventing the instrument. But it seems certain that Hans Lippersheim had never known nor heard of the discovery made by Adriaensz, and so, if Adriaensz had not lived we still should owe to Hans Lippersheim's quick wit and his little daughter's lucky meddling, one of the most valuable and wonderful of human inventions—*St. Nicholas for February, 1882.*

Carthage, Mo., has three flouring mills, aggregating 17 runs of burrs.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, FEBRUARY, 1882.

We respectfully request our readers when they write to persons or firms advertising in his paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

FLOUR MILL DIRECTORY.

Cawker's American Flour Mill Directory for 1882, is now complete and ready for delivery this 31st day of January, 1882.

It shows that there are in the United States 21,356 flour mills and in the Dominion of Canada 1488. The mills in the United States are distributed as follows:

Alabama, 388; Arizona, 17; Arkansas, 234; California, 209; Colorado, 52; Connecticut, 309; Dakota, 44; Delaware, 96; District of Columbia, 7; Florida, 81; Georgia, 514; Idaho, 18; Illinois, 1258; Indiana, 1163; Indian Territory, 3; Iowa, 872; Kansas, 437; Kentucky, 642; Louisiana, 41; Maine, 220; Maryland, 349; Massachusetts, 363; Michigan, 831; Minnesota, 472; Mississippi, 297; Missouri, 942; Montana, 20; Nebraska, 205; Nevada, 10; New Hampshire, 202; New Jersey, 445; New Mexico, 28; New York, 1942; North Carolina, 556; Ohio, 1462; Oregon, 129; Pennsylvania, 2786; Rhode Island, 47; South Carolina, 205; Tennessee, 620; Texas, 548; Utah, 129; Vermont, 231; Virginia, 689; Washington Territory, 45; West Virginia, 404; Wisconsin, 780; Wyoming, 3; Total, 21,356.

The directory is printed from new Burgeois type on heavy tinted paper and is substantially bound. It makes a book of 200 large pages. The post offices are alphabetically arranged in each state, territory or province. The name of the mill, the kind of power used and the capacity of barrels of flour per day of 24 hours are given wherever obtained which is in thousands of instances. This work is indispensable to all business men desiring to reach the American Milling Trade.

Price Ten Dollars per copy on receipt of which it will be sent post paid to any address. Remit by registered letter, post-office money-order or draft on Chicago or New York made payable to the order of E. Harrison Cawker, publisher of THE UNITED STATES MILLER, Milwaukee Wis.

Mr. L. SANIAL, formerly editor of the *American Protectionist* has assumed editorial charge of the *Industrial Monthly* of New York. Mr. Sanial's well-known ability will doubtless prove of great advantage to the future prosperity of the *Industrial Monthly*.

On the 7th of January orders were received at New Orleans to provide freight room in March and April for 180,000 bushels of wheat from California destined for Great Britain. The wheat will be shipped from California to New Orleans by the Southern Pacific Railroad and thence by steamer direct to British ports. If this first shipment of a large quantity of grain by this route should prove successful there seems to be but little doubt that the grain trade of California will receive a decided impetus.

The population of the United States has been increased during the year 1881 nearly half a million by immigration from Europe. We have room for 500,000,000 more immigrants from Europe, but we

want the best they have got. The immigration from Great Britain during the year 1882 will be unprecedentedly large especially from the middle classes. The young Englishman of enterprise and spirit feels hampered by the circumstances with which he is surrounded in a country so thickly settled and is anxious to go to an English speaking country where the possibilities of the future are pleasing to contemplate. The Americanized Englishman very often takes a more heartfelt interest in our national and private matters of welfare than many "Yankees" of the oldest stock.

About Small Flour Mills.

A well-known milling engineer says that small mills if properly constructed can make a proportionate profit to large ones. By building the mill right, with the proper number of runs of stone or sets of rolls, custom work can be done and one dollar more per barrel can be realized for all the flour made by the mill and sold on the market. A small mill can do good work and turn out the very best quality of flour if the wheat is good. "But" continues the writer, "to do this it must have, first sufficient bolting surface to bolt out all the clear flour made by the first grinding; second, sufficient bolting capacity to rebolt all the returns and dustings from middlings; third, sufficient bolting capacity to bolt out all the flour from the ground middlings; fourth, sufficient bolting capacity to dust and rebolt dustings from second middlings; fifth, sufficient bolting capacity to bolt out all the flour from the reground bran and separate any fine middlings from it, if any should result from each bolting and grinding; sixth, at least one set of rolls and sufficient bolt to bolt and separate their products. This any mill must have in order to do good work. No less will accomplish the work.

Recent Milling Patents.

During the past month the following patents were granted on the dates specified to the parties named:

December 27th, 1881:—Attrition Mill, Henry A. Duc, Jr., Charleston, S. C.; grain-spout, James M. Hendershot, Atchison, Kan.; grain-drier, Eugene Louis, Montgomery, Ill.; flour-packer attachment John P. Ward, Minneapolis, Minn.

January 3, 1882:—Roller-mill for grinding grain, Charles G. Burkhardt, Buffalo, N. Y.; crushing and grinding machine, George Duryee, Rahway, N. J.; grain-cleaner, William C. Holmes, Indianapolis, Ind.; reducing and separating maize, Martin L. Mowrer, Dayton, Ohio; flour-bolt, Charles Schacht, Marine, Ill.; grain-cleaner, William Williamson, Rio Vista, Cal.; dust collector for middlings purifiers, Augustus Wolf, East Hempfield, Pa.

January 10, 1882:—Feed-regulator for grinding-mills, Gilbert S. Graves, Buffalo, N. Y.; grain-scourer, Daniel Mann, West Winfield, N. Y.; dust-collector for middlings purifiers, William S. Russell, Northfield, Minn.; machinery for dressing and sifting flour, W. H. Williamson, Wakefield, England; grinding-mill, Stephen P. Walling, South Edmeston, N. Y.; feed grinding mill, Oswald E. Winger, Freeport, Ill.

January 17, 1882:—Attrition mill, Henry A. Duc, Jr., Charleston, S. C.; grain-separator, Jefferson Grube, Auburn, Ind.; grain elevator, Edward C. Hinckley, Delmar, Iowa; millstone driver, Louis P. Weaver, Jr., New Harmony, Ind.

Mr. F. HARDOUIN, a French milling engineer, of great experience in his work just published, entitled, "L'Art de Moulin" ("The Art of Grinding") says:

"If, instead of sending bad stones to Germany, England and the United States, as we have done for forty years, we had furnished the best stones, the roller system would not even have been attempted. Instead of foolishly destroying existing mills, let us improve, but preserve our present system, for it will lead to that perfection which is necessary to preserve our ancient superiority.

Practice vs. Theory.

R. JAMES ABERNATHEY.

Whether or not the people, as a rule, become more practical and less visionary or theoretical as the world grows older, is perhaps a question. But, certain it is, that those engaged in the development of vast industrial interests, are interested in knowing by actual practical demonstration and test what is true and what false. The leading questions to be answered are, has it the power, the strength, the efficiency, the capability in every way to do the work represented. If the questions cannot be satisfactorily answered, all interest in the matter ceases with the inquiring practical mind. Dynamometer, or other instrumental measurements of useful effect, are not held in very high esteem by this same practical mind. He does not fully understand the working of such instruments; or, if he does, he thinks there are too many chances for "slips" to entirely depend upon them for measurements of efficiency. My dynamometer friend might say to him that a certain belt was transmitting eight horse power. "How do you know?" "Have just measured it with the instrument." He admits at once that the measurement may be true, and the result correct, but he is in doubt about it and unwilling to accept it without additional proof. On the contrary, however, I will go to him and say a certain belt is capable of transmitting 10 horse power. "How do you know it is?" is again abruptly asked. I have just raised a 10,000 pound weight 33 feet high in one minute." Being satisfied that I am telling the truth, no further questions are asked, or doubts expressed. Such a test is regarded as eminently practical, because the thing tested is made to do the work in a positive way. If a mangoes on the market with a machine of any kind and offers it for sale he must know by actual working tests that the machine will do what it is designed to do, and the party he offers to sell to must be satisfied of the fact, otherwise the machine will not be touched except on trial on its merits. It does not matter how thoroughly a machine may be constructed, or how complete theoretically it may seem, it must be tried at work before it will be accepted. This is the seemingly severe ordeal that all new machine appliances or processes must go through before receiving due recognition.

It matters but little how practical the inventor, designer, or builder may be, his efforts are deemed theoretical until they have been tested at work. This is especially true with makers of machines combining a number of different and simple elements or principles. All may be satisfied that each of the elements independent of the other is well understood and all right, but are not satisfied that the combination will work all right until it has been tried and well tried. After a trial has been made and proven successful all ideas of theory in connection with it ceases, and it is accepted as practical. Other machines built precisely like the first and for the same purpose are accepted without question. And there is really no question about the practicability of larger or smaller machines built on the same general plan and for the same purpose.

The combination has been thoroughly tried and found to work well, and that is all that is cared for. With this full understanding of the facts, the maker of the machines can go ahead and get up all sizes and as many as can be placed taking care only that no defects in construction are permitted. This by some might be considered going ahead on theory, but it is not, any more than it would be to calculate by rule the hypotenuse of a triangle the base and perpendicular being given instead of making a triangle for the purpose of measuring it.

The idea of theory ceases after actual tests have been made, and the combination and the relations that elements bear to each other are fully understood. Nature is true to herself at all times, and after man has discovered that certain elements combined in a certain way produce certain results, he can always depend upon it that if he adheres strictly to the plan in construction, combination and apportionment, the results will be precisely the same. What is true of machines and processes, is true of all other artificial appliances where nature or the laws thereof take a prominent part in the performance of the duties required. If as has been said, the doubting man is satisfied that a certain belt of a given width and running at a given speed with a given arc of contact on pulley is transmitting ten horse power, he is also satisfied if the belt is made twice as wide, all the other conditions remaining the same, it will transmit twice the power. There is nothing truer than this proposition. It is not theoretical, but eminently practical

and can never fail except when faulty in construction. Deductions made from thoroughly tried and well known principles, or elements, or combinations of the same, are not theoretical but practical, and where or whenever the same cannot be reduced to practice it is the fault of construction or arrangement. It is true though, that no man is well calculated to make working deductions unless he is reasonably well acquainted with the practical workings of the causes from which he intends to produce results or effects. And the greater his knowledge, the longer his experience in the working results and effects of the mechanical combinations, the more certain are his calculations in reasoning from cause to effect. A man who has had no practical experience, has found out by reading or otherwise, that a combination of air and riddles is an excellent method of cleaning wheat or other grain. He supposes that he knows all about it and proceeds to construct his machine. But to his astonishment he finds the machine will not do the required work. The trouble was he knew nothing about harmony in the matter. He understood the plan in general but knew nothing about fixing the details. He did not know how large the fan should be nor how fast it ought to run, did not know what size to make his riddles, nor what angle or pitch to give them, nor what size the perforations should be. All of these things had to be afterward learned by practical experience before success could be obtained. That man's work was purely theoretical, and hence not successful. On the contrary a man who has had abundance of experience in riddling grain and in blowing it with fans and is a good practical mechanic as well, goes to work to combine these elements into one machine and with perhaps the exception of some minor details that may need re-arranging, his machine works successfully from the start. That man's work was practical. The difference between the two is, one went to work intelligently on the basis of a good practical knowledge, the other blindly on a basis of mere theory. And right here is where we want to draw the line of distinction. The great industrial interests of the world demand that all mechanical appliances be rigidly tested at work before they are willing to accept. The same interests and all interested demand that the man or set of men who attempt to make appliances, to teach or instruct must themselves first be tested in the crucible of hard practical thought and experiences. By that means only can any reasonable degree of certainty be arrived at. Purely theoretical men should be dropped out, compelled to learn somewhat by practice what they attempt to teach.

It is true that practical men make mistakes. All classes of men do that, but it is a thousand times safer to have a good practical knowledge than have none at all. And I would like to say right here to all young beginners as they learn practically to also contract a habit of thinking, learn to trace the workings of causes to their effects, and effects back to causes. In other words, become students, and continue to be students. If you run into difficulties think and study yourselves out. It will pay you in the future and be of inestimable value to mankind. The writer has always been a student, and is a student to-day but he been by no means as studious as he should have been; much valuable time has been wasted and an ignorance of many things of which he should have been well informed now stares him in the face. Avoid this and you benefit yourselves and the world at large as well.—*The Millstone (Indianapolis, Ind.)*.

It will be painful news to the millers of Indiana to read the announcement of the sudden death, on the 15th inst. of Mr. R. L. Thompson, of Terre Haute. Mr. Thompson was one of the most extensive millers of the state, and one of the most active and energetic men in any movement looking to the advancement of the milling interests of Indiana. He was a prominent and influential member of the millers' state association, and usually represented the state in the councils of the national body. His mill at Terre Haute had been lately enlarged and improved with the newest class of machinery. He died very suddenly with rheumatism of the heart.—*Millstone*.

THE Bureau Valley flouring mill, located one mile south of Bureau Junction, Ill., burned Jan. 20th. The fire originated in a hot box. The loss is at least \$10,000, and the property was insured for \$3,000. The owners will at once rebuild. The mill was one of the old land marks in that section of the country, and was generally called the "old Red Mill."

THE MILLER'S NIECE.

III
(Continued from January Number.)

The miller came in to tea, and, though he smelt a little strongly of flour, was otherwise agreeable to the fastidious taste of Josiah. To look at him as he sat at his own table with thin white hair straggling to his shoulders, wrinkled face, lack-lustre eyes, and an air of absolute and hopeless dejection, one would have guessed his age as seventy-five. It was occasionally when his niece poked to him that his aspect changed, and then momentarily came back to him the strength and cheerfulness which stands by sixty when a man has lived happily and is prosperous.

"The old gentleman seems in low spirits to-day," Josiah observed to Frank.

It was night, and they were sitting in the room which served for breakfast, dinner, tea and supper. At 10 o'clock the miller, his niece and the whole establishment were accustomed to retire to rest, and half an hour later were probably asleep. Frank was not able to fall in with these pleasing manners, and was accustomed to sit up later in order to smoke a pipe. Josiah would rather have gone to bed, but his inclination was not of much consequence at any time, and none at all when in company with Frank Fisher. It seemed good to Frank to sit up late and smoke. He preferred to do it with company, and, willy nilly, Josiah sat up with him, getting his clothes odiously impregnated with tobacco smoke.

"A little low to-day, isn't he?" Josiah repeated apologetically, for Frank had not replied to his first remark, being overcome by one of those fits of staring steadily into the fire the while he puffed.

"He is much the same as usual, or as he has been any time these last ten years," he answered presently.

"Oh!" said Josiah. "I thought perhaps flour had gone up or down, or the boiler had burst at the mill, or something unpleasant had happened."

"No, Josiah, we are somewhat advanced beyond that stage. At the period of our history with which you are best acquainted they may have had boilers in water mills, but in the present day they use the water cold. Nevertheless, it was at the mill that happened the events to which are traceable the old man's depression. I think I mentioned when we were at Battleborough a little circumstance which led to my making a sketch of some county magistrates and their court? It was here, or rather over at the mill yonder, that the murder took place. It was the old man's nephew who was foully put to death."

"Miss Hargraves's brother?"

"Yes, Mary's brother."

Frank said no more, but, with his chin sunk on his chest, sat slowly smoking and staring into the fire.

"I think I'll go to bed now," said Josiah after a pause, rising and yawning in an engaging manner, designed to hide a growing state of nervousness. In Battleborough he had been consumed by a gentle desire to know all about the mystery that had affected these three lives. But he did not care to hear the story close upon midnight, within sight of the scene of the tragedy.

"Sit down, old man," said Frank peremptorily; "it's early yet, and I don't mind telling you now that you are here that I brought you down here with a special object not fully revealed in my reference to the Roman chimney-pots. I may want you to do something. Don't look so uncomfortable. It may come to nothing, and at worst you will figure in it only as a looker-on—a credible witness, if witnesses be needed, which they may not be. Or perhaps I may be a stupid old fool."

The cold sweat broke forth on Josiah's brow as he contemplated the situation. Here he was, against his inclination at the outset, in a lonely hamlet, with a man of strong will, and perhaps undeveloped tendencies to lunacy, who had a murder on his mind, and wanted Josiah to have something to do with it.

"I told you I found this place accidentally," Frank said, taking no more notice of Josiah's perturbation than a snake bestows on the trembling of a rabbit on which it has fixed its glittering eye preparatory to munching its bones. "I came down here sketching some of those quaint houses, and staying over at the little inn met the miller, who came down on summer evenings to play bowls. He asked me to his house, where I met Mary, then a girl of seventeen, and the fairest, freshest creature I ever met. I am not going to make a long story of it. It is the old, old story, which you have doubtless already guessed. I fell in love with Mary, and dared to hope she would come to London as my wife."

"Her brother Jack was two years older than she; a handsome, high-spirited lad, who fretted under the rule of his uncle that bound him to the hateful enterprise of the mill. He did not quite know what he wanted to be. But he had a very strong conviction that he was not meant to be a miller. Hargraves—who at that time was a very different man from what you find him now, being as obstinate as a pig and as self-willed as an ass—ruthlessly resisted these longings to be free. There had been a Hargraves miller at Ellendale as far back as record went. The present mill was built by our friend up stairs, and worked by him with substantial profit and universal credit. His sister, going outside the parish of Ellendale, and hankering after better things, had married a gentleman, who had of course died leaving her in a state of destitution. The miller would not have her back in Ellendale. But he was careful that she should not absolutely starve in London, and when she died he himself went up to Camden Town, saw her decently buried, and brought down Jack and Mary, then aged respectfully nine and seven. He meant to do his duty by them when he took them in hand, and he had done it. Both had had a first-class education and a comfortable home, which in these last months was daily growing in grace under the touches of Mary, now installed as housekeeper. Jack, the miller said, should have the mill when he was gone, due provision being made for Mary. What could be fairer or kinder than this? As for Jack's repugnance to account-books and his abhorrence of the sight of sacks of flour, that was merely boyish ignorance."

"The miller," added Frank, severely, all unconscious that there was someone else in the room whom the cap might fit, "was one of those people who, as they say, put their foot down, never doubting that, since they have taken the action, it must be put down in the right place. He put his foot down on the declaration that Jack should keep the accounts, collect the money, and have a settlement with his uncle every Saturday night. Jack yielded perforce, though it was evident he would take the first opportunity of breaking the hateful bonds."

"In the meantime he kept the accounts very badly, and the peace of Saturday evening was often broken by discussion between his uncle and himself, in which two hot tempers came into collision. I suppose Jack had been having a row with his uncle when he met me one Saturday afternoon strolling home with my sketch-book under my arm. He fiercely opened on me with inquiry as to what I wanted making love to his sister. The inquiry, as indicating discovery of what I thought was a secret locked in my own breast, staggered me to such an extent that I only half heard the hot-blooded youth rattling on with wild remarks, and I was presently stupefied by receiving a blow in the face well planted between my eyes. This was Jack's peroration, his emphasis to a declaration that as long as he lived he would have no London gentlemen prowling around his sister. Jack was a tall, well-made youth, though slight in build, and no more a match for me than—than—if I may say so without disrespect,—you are at the present moment. We were not far from the cottage at the end of the field by the mill-stream, which, having done its work, here runs on in the full majesty of its broad channel full four feet deep. The lad's remarks about my intentions towards his sister did not hurt me, being childish and of course absolutely without foundation. But I could not quite stand the blow; so while the young champion was raging round, I took him by the heels and the collar, and dropped him into the stream. I knew he could not drown in that depth, and the cool water might do him good. Turning round after walking on some distance, I saw Jack scrambling out of the stream. I expect he was wild with passion, and he stood there shaking his fist at me and shouting something that I could not hear. That was the last I saw of him till the following afternoon I helped to carry him, wounded to death, up to the little bed on which an hour or two later he breathed his last."

"Hadn't he been seen from the time you parted with him till this happened?"

"Oh, yes, he went home, and when Mary, alarmed at his appearance, asked him what was the matter, he said he had fallen into the mill stream. But he must have told his uncle about our encounter, for it was through him the news of it reached the sapient police. On the following morning after this little affair, Jack got up and, dressed in his Sunday best, as usual, went over to the mill to square up some accounts. His uncle came down and breakfasted by himself at half past 9. At quarter past 10 he left the room and went over

to the mill, returning to the house about a quarter of an hour later. I can remember those particulars, as they were of course set forward with great detail at the inquest. Mary, wondering where Jack could be so long, asked her uncle, had he seen him? He said "No," asked Mary for his black coat and waistcoat, put them on in place of those he was wearing, and went to church. When he came from church Mary, increasing in marvel, asked him again if he had seen Jack, and again he said "No."

They dined about 1 o'clock, and an hour later the old man, now himself getting a little anxious at the prolonged absence of his nephew, went out and called on a neighbor to help him to search for Jack. The two men went down to the mill pond, and after a brief search concluded that Jack was not there and separated, the miller returning to the house. Later in the afternoon the miller went to the mill to get a feed for the horse. Seeing blood on the mill floor and on the scoop, he concluded that the worst had happened, and once more calling in a neighbor, being himself too nervous to search, the men found poor old Jack at the bottom of the steps leading from the mill floor. He was lying partly on his face, his right arm doubled over his head. Near him was a stout stick covered at the top with blood. He was disfigured with wounds on the head, and, though still breathing, was evidently on the point of death. They carried him to the house. We carried him up stairs, where he presently died, without even a momentary return to sensibility."

"The police being summoned, commenced in due form a search for 'a clew.' On the middle floor of the mill, where it was evident the murderous attack had commenced, the account book which Jack had entered the mill to balance was found lying open. Up to the forty-third entry made in the new year, all were in Jack's handwriting. Two later entries had been made in the handwriting of the miller himself. On the page headed "February 20, 1870," were spots of blood in two places smeared over, apparently in an attempt to wipe them off. There were spots of blood on several of the pages, but they were smeared only on this particular page. Twelve or thirteen leaves were indented, as if they had been struck with some heavy pointed instrument. On the lower floor, nearer the place where Jack was found, the police picked up a mill-punch covered with blood. From the general appearance of the place all the witnesses examined at the inquest arrived at the conclusion that Jack had been on the middle floor engaged in making up his accounts when the attack had commenced, and that he had struggled with his assailant, who, overpowering him, had thrown him through the opening in the floor into the room below. There was some talk in the neighborhood about these entries made in continuation of Jack's work, evidently done at some time subsequent to the moment at which he had been engaged with the books when broken in upon by his murderer. But the miller was able to explain the matter. "Sometimes," he said in reply to the coroner, "the deceased neglected to make entries in his account book when he was in the habit of receiving money from me. He neglected to make two on Saturday, and I made them yesterday,"—that is to say, on the day following that of the murder of his nephew, when the blood on the leaves could scarcely be dry. But of course, painful as these circumstances are in a family, business must be attended to."

"It was after the first adjournment of the inquest that the police pounced upon me. Hargraves had, in a natural attempt to call to mind all circumstances in the recent history of his nephew, mentioned our quarrel of Saturday. To the mind of a country policeman the whole dark landscape was forthwith illumined. We had quarrelled; he had struck me and I—what had I done? Why, taken him up as easily as a child might be lifted, and had dropped him into the mill-stream. What could be clearer than that I had repeated this gymnastic performance in the mill, had taken him up and dropped him down the passage on to the lower floor? Accordingly, when I arrived post-haste at Ellendale, on reading the account of the murder in the newspapers, I found myself in the arms of old Bodkins, a good-natured, pudding-headed policeman, with whom I had smoked many a pipe in quiet country lanes. He almost blubbered as he put the handcuffs on me, and was, I own, unfeignedly sorry. But, as he said, duty must be done, and the magistrate—on the whole, a denser personage than Bodkins himself—had signed a warrant for my arrest."

"I was taken off to Battleborough through

a gaping crowd, who, forgetful of the interchange of many courtesies, were unanimously of the opinion that I was guilty. In fact, it turned out—what had never before been suspected—that my intermittent residence in the village, and my lonely wanderings with a sketch-book in my hand, had resulted in a deeply-seated and unanimous feeling that I was after no good; and that I should be arrested on a charge of murder seemed to these good people quite a natural conclusion."

"I was brought up before the magistrates the next morning, when I made the sketch of which I told you. I was remanded for three days, which sufficed to bring to the knowledge of the police a circumstance which they might perhaps have learned earlier, if they had not shut their eyes, lowered their heads, and run at me bull-fashion. On the Saturday night, being myself a little upset with my quarrel with Jack, and desiring a few quiet moments to think the matter over, I had walked over to Battleborough, had slept at the Falstaff, had had my shaving-water brought up at 9 o'clock, had breakfasted at 10, had gone over to the old church for the 11 o'clock service, which I had diligently sat throughout—though, if my deliverance had depended on my ability to say what the sermon was about, I should infallibly have been hanged. All this was as plain as day, and there remained nothing but for the police to release me with many apologies from the gentlemen on the bench, and amid much rapturous blubbering on the part of Bodkins, who wanted to shake hands with me all across the market-place. But I had had enough of the police and Battleborough, and even of Ellendale, which I saw no more till the morning I met you."

"I cannot say that I was incensed against the old man for the trouble to which he had put me. It was natural enough that in his anxiety to clear up the whole matter, he should mention what Jack had told him about our fight, which, moreover, did not appear altogether without bearing upon what followed. What I was maddened at, was the fact that this unfortunate setting of the police upon the wrong track lured them away from other pathways on which the scent of blood lay, and which might, perhaps, have led them to poor Jack's murderer. As it was, nothing was discovered then, or has been since. The murder has added another to those mysteries which crowd the pages of our criminal records, and Jack's young life is unavenged. I am not a vindictive man, I trust; but I own I should like to place my hand on the shoulder of the murderer, with the old stern cry of the prophet: "Thou art the man!"

Frank's pipe had gone out, and he sat with his chin sunk on his chest staring into the fire, after a manner with which Josiah had of late grown familiar. But he had not before seen this resolute look on his face, in which there was something of anguish, as if he were struggling between a hateful task and a call to duty.

"Look what he has done," he added after a pause, using the personal pronoun, that seemed to Josiah as if he had in his mind some particular person. "The blow, foully dealt, that killed the poor lad, also destroyed the happiness of two lives. I was certain from what Jack said to me that he had observed in Mary what confirmed my hopes, and that part of his anger with me was borne of the conviction that I was trifling with affections already gained. I could not marry Mary with this horrible mystery hanging over the house; and as I could not live near her and not speak, I went away. What may seem to be the wreck of my own career is of no great matter. That is a fracture not too late to mend. But, whatever may happen, the other dream has gone forever. I felt irresistibly drawn back here just now, for to-morrow it is ten years since this thing was done. I want to look about me a bit, meaning to take this matter up, and see it through, at whatever cost. That's what I am here for, Josiah, and now you know all about it, including the mystery of muddy boots and mysterious walks."

"Yes," said Josiah, "but it does not explain why I am here."

"I daresay you wish you were not. But the fact is that I felt I must talk of this matter to someone, and Heaven seemed to have sent you at this particular crisis. You can listen and not talk, and moreover, I may want a witness. Now good night; go to bed and don't dream."

IV.

The next morning was Sunday; a day such as that the memory of which Herbert has made memorable:

So fair, so bright,
The bridal of the earth and sky.

Apparently the threatened snow-storm had blown over and the sun shone through a blue and cloudless sky. Like everyone else in Ellendale, the miller's household went to church on Sunday morning. Frank and Mary walked on to church together, Josiah following after, keeping pace with the feeble steps of the miller. If Josiah had not known what sad anniversary had come about, he would not have failed to surmise that some uncommon influence was at work. The miller had taken to his shoulders an added stoop. The ever present sadness on his face was deepened.

Josiah's gentle nature was greatly drawn toward him, and brief as had been their acquaintance he sat and talked with him for hours, conveying to the miller much amazing information relative to traces of deserted towns and hamlets at low levels. The old man talked to Josiah with equal readiness. He conversed with him much more than with his older friend Frank whose conversational powers were in truth of a varied and spasmodic nature.

As has been seen, Frank indulged in long monologues in Josiah's company, at times when more properly he should have been in bed. At other times he would sit and smoke and look unutterable things straight into the fire. On this particular day he was at his gloomiest, and saw more in the fire than met the eye of Josiah or anyone else in the room. Only with Mary was he unvarying in his manner. He had probably set for himself the model of a brother in company with a favorite sister. But there were some lapses from the type not too slight for the simple mind of Josiah to detect. Whether Mary saw or felt them, who could tell?—since she herself betrayed no indication. Frank was an old friend, always welcome in happier times. He had gone away at a period of trouble, some portion of which was accidentally brought home to him. For ten years nothing had been heard of him. Not a line had reached her directly or indirectly. She had come to regard him as dead, when without note or preparation he one day walked into the cottage, placed his hat on his accustomed peg, and the room was once more filled with the resonant sound of a familiar voice that had once been part of her daily life.

Mary was greatly fluttered, as any maiden might be in similar circumstances, but Frank's eccentric nonchalance communicated itself to her. If he took matters so coolly why should she be in a flutter? Accordingly after the first few moments' agitation, natural in the face of this apparition from the supposed dead, Mary was slicing cold ham for Frank's luncheon with as perfect equanimity, and more than as much grace, as was displayed by Charlotte when Werther first saw her cutting bread and butter.

The miller was not able to take matters so quietly. Frank's coming was more than that of an old friend long lost to sight of eye or touch of hand. He brought with him the memory of terrible days that had seemed to be fast folded in the grave.

The dead boy was daily with them at meat though he filled no chair and claimed no part in the conversation. The influence of his presence was seen in the miller's ever-deepening grief, which seemed, as it increasingly possessed him, to absorb all the grosser parts of his nature, leaving him as simple as a child and as gentle as a woman. In Frank the chilling influence of the nameless guest was displayed in his fits of taciturnity and his increased consumption of tobacco.

Only Mary seemed unconscious of the proximity. She had loved her brother and passionately mourned his untimely death. But there was perhaps another sorrow bound up with it which, unconsciously mingled, had taken the elasticity out of her steps, much of the laughter out of her eyes, and had made her a woman before her time. Josiah noticed that whenever Frank spoke to the miller's niece his face beamed with a sudden flush of delight.

V.

Mary prattled all the way to church with Frank, and Frank talked to her with as light a heart as if he had never made that sketch on the bare wall of a room at Battleborough which at other times seemed burned into his memory.

"How wise these young people think themselves as compared with us!" Josiah reflected. "A little common sense and courage would put all right. She loves him and he loves her. But he goes prowling round in the early morning and sitting up late at night, creating

nightmares for himself and brooding over mysteries, till he will have his brain addled and his blood soured. She doesn't know what to make of it, but is proud and modest, and perhaps keeps Frank off when at times he might find himself enjoying a lucid interval. I will sit up with him one night more and talk to him plainly."

With which resolution Josiah fixed his spectacles so as to get the range of the pulpit, and having put on an appearance of profound attention, which gradually drew the rector unconsciously to address himself to him personally as being the most attentive member of the congregation, he closed his eyes and recaptured twenty minutes' sleep filched from him over-night by Frank's unwholesome habits.

It was a slumberous morning, closed in by a peaceful evening. With the fall of darkness came the snow, long threatening. Ellendale drew up its chair round the fire and enjoyed the absolute peace of the Sabbath evening. Nowhere was it more peaceable than at the mill cottage. When supper was over, Mary brought the great Bible in which the names of innumerable Hargraves were entered, and the old man read with clear voice the hundred and second Psalm. "My days are consumed like smoke, and my bones are burned as an hearth. My heart is smitten, and withered like grass; so that I forget to eat my bread. . . . My days are like a shadow that declineth; and I am withered like grass. But thou, O Lord, shalt endure forever; and Thy remembrance unto all generations."

He was evidently back once more with his troubles, and they seemed all the greater to him by reason of the surcease but just enjoyed.

"Frank," said Josiah, as the two sat before the fire for what Frank modestly called his last pipe, "don't you think you are a great fool?"

This was strong language from the lips of Josiah. But it was used with a purpose. He had made up his mind to put an end to the misunderstanding that he imagined existed between his old friend and the miller's niece, and, as is the manner with mild men when facing a mighty resolve, he was inclined to err on the side of strong language.

Frank looked up and regarded the speaker with lazy curiosity.

"What for? Because I cannot go to bed early after the manner of a learned and automatic thing like you? or because, when I smoke a pipe, I like to have one that will hold more than a pinch of tobacco? There is a little monotony in your criticism of my habits, which generally alternates between these two points. Which is it to-night?"

"Neither; I was thinking of Mary. I don't of course know much of such matters; but if ordinary eyesight serves me, I should say that she is as much in love with you as you are with her, and I suppose you know how much that is."

Josiah spoke in a tone of assumed confidence, though all the while he was horribly frightened, and nervously kept his eyes fixed on Frank's face, not quite sure what a man like him might do in circumstances like these. Finding that he listened with a certain wistful look on his face, Josiah proceeded more briskly.

"Now, if I were you, Frank, and knew my own mind, I should take an opportunity to-morrow of bringing this matter to a head. I suppose you are certain of the uncle's consent. In such case, the next thing—"

"Josiah," said Frank, quickly looking up, and speaking in a hard voice that contrasted with his former gentle tone, "oblige me by not again referring to this subject. What you talk of can never be. I have told you my secret, but in other quarters I have, I think, safely guarded it. That's my only excuse to myself for coming here again. I came on another errand than love. It may be accomplished or it may not. In either case, I cannot hope for any conclusion that would make it possible for me to speak to Mary the words that linger on my lips whenever—as seldom happens, if I can help it—I am alone with her."

Hereupon Josiah collapsed much after the miserable and woe-begone fashion of a hat that has been sat upon. He had nerved himself with great effort for the task he had undertaken. He had started well, and had been much pleased with the easy flow of his own speech, and with its apparent effect upon Frank. Now he was cast down and in a generally limp and unhappy condition. All this was nothing to him, and what had he done that he should be drawn into the toils of this crime and mystery, and breaking up of young hearts? He was something more than half in

love with the miller's niece himself, and if the tangled skein could have been unravelled by placing at her feet such portions of the manuscript of "Underground England," as were complete, he was at the moment just in that desperate frame of mind that would have led him to take the act.

He got out of the parlor and stole along the lobby feeling for the head of the banisters, which were fixed midway between the parlor and the kitchen. The kitchen door was more than half open, and a shaft of light projected itself into the hall. Josiah's blood froze, and if his hair did not stand upright, he had a curious sensation about its roots that favored the delusion.

When he mastered the situation there was nothing particularly dreadful about it. The miller was in the kitchen—a circumstance which, seeing that he was master of the house, was not particularly remarkable. He was sitting on a chair pulling on a pair of big boots; also a matter-of-fact procedure not to be challenged by a guest. Nevertheless, it was odd that a man of regular habits, who, according to custom, went to bed at 10 o'clock and might not be expected to rise till 6, should be discovered in the kitchen in the dead of the night, putting on a pair of boots by the light of a bull's-eye lantern.

The look of the old man's face did not tend to reassure the looker-on in the lobby. Josiah saw, with a fresh icy current running through his spine, that the old man's face was purple with suppressed passion, over which sometimes flitted a look of horror. He was talking to himself—at least, his lips moved, though no articulate sound escaped him. He seemed to be expostulating with someone, violently shaking his head, and sometimes pausing in the operation of pulling on his boots to shake his fist. When he had, with much stamping and thrusting, got on his boots, he put on a great overcoat, wound a muffler round his throat, pulled on a thick woolen cap, took up his blackthorn stick lying in a corner of the kitchen, and with the lantern in the other hand, made for the door leading out at the back in the direction of the mill.

VI.

"Frank! Frank!"

Josiah was shaking up the burly figure seated at the fire, with astonishing frenzy. But Frank had at last actually fallen asleep, and took a great deal of rousing.

"There is something the matter with the miller, Frank. I saw him go out just now at the back door, and I don't think he is in a condition to be trusted by himself."

Frank was wide awake now.

"Is it snowing?" he said.

"Yes, I think so. I saw the door open for a moment, and by the light of the lantern I just caught a glimpse of falling flakes."

"Get on your things as quick as you can and come along with me—quietly, though—and don't disturb the household or let Mary know anything of this."

They were dressed and down in less than five minutes, and, standing at the open door by which the miller had just passed out, looked out on the night. They could not see far, though there was all about the luminous glare that comes from untrodden snow. Frank strode straight on over the pathless snow and through the blinding storm. They had not got thirty paces from the house, before, like everything else, it disappeared from view. The wind was blowing the snow direct in their teeth. They saw the mill presently, having kept on a bee-line for it. The key was in the door on the outside, and it remained for them only to lift the latch and walk in. The door opened on to a room in which the sacks of corn were heaped. Through the centre of the floor chains passed, connected with a winch, for the purpose of raising and lowering sacks of flour. The lower room was in total darkness, but through the aperture in the floor above, through which access was gained by steps, they saw the faint glimmer of a light.

"Don't speak," Frank whispered, "follow me closely and quietly."

Creeping gently up the staircase with Josiah exceedingly close at his heels, they heard the miller talking in a loud and angry voice. He seemed to have someone with him, though the other made no audible reply to his bitter reproaches and passionate denunciation. When they reached the level of the floor, and could look in, they saw that the miller was alone. He had taken off the thick overcoat and pushed the woolen cap back over his forehead. He was standing by a plain deal desk, set against the wall, which in the day time was used by the clerk who had

taken the place once filled by Jack. In fact the desk was in exactly the same place where it was on the Sunday morning when Jack sat at it for the last time.

The miller had placed the lantern on the desk with the dark side toward the staircase, leaving all that part of the room in deep shadow. He stood with his left elbow on the desk, his right hand nervously grasping the thick blackthorn Josiah had seen him take up out of the kitchen. The light of the lantern shone full on his face, which was distorted by passion. The account-book lay open on the desk, and the miller was apparently expostulating with someone in reference to its condition. But as far as the shivering Josiah could make out, there was no one in the room, and he watched with growing horror the eyes of the miller, blazing with passion, apparently fixed upon someone whom he saw sitting on the stool.

"A good-for-nothing lazy lad!" the miller was shouting at the top of his voice when the two guests from the cottage came within hearing. "This is a pretty return you make me for all I have done! I had no call to take you out of the squalor in which your fine gentleman father left you. If it had been me who was in his shoes and him in mine, I warrant he would have left me and mine to starve. But I take you up, give you a good home grudge you no pocket-money, don't ask you to do too much for it, and look here! Here are three accounts that I can call to mind at the moment which you don't enter in the book, and which, if I had not looked over the list would never have been asked for. I am not going to work this mill for nothing or for good-for-nothings. You will have a week to think of it. Next time a thing like this happens, you leave the place, go your own way, and if ever I catch you writing to Mary, or trying to see her when you have once left the mill, I will bundle her out after you, and you may both go and starve in fine-gentleman fashion."

As the miller said these words his voice rose almost to a scream. There was lying by the open book a mill-punch, which whilst he spoke he had taken up in his left hand, and as he uttered this last threat he smote the iron punch with pointed end downward into the open account book, piercing it at every blow.

"Ha!" he screamed, "you'll strike your uncle! Take that," and with his left hand he struck at the air above the stool, where Josiah instinctively felt the head of the lad would be supposing he were sitting there in the body. Leaping backward as if he himself had been struck in the face, the miller made as if he were closing with an antagonist. With panting breath, but otherwise in grim silence, the old man fought with his ghostly adversary, stumbling and struggling about the room till he beat the invisible Something against the wall, and then stood back regarding it. Suddenly he made a dash at the chains which passed from floor to floor through the middle of the room, and beat on them fiercely with his stick, from which Josiah gathered with horrid distinctness that the lad, having been beaten down in the corner of the room, had, in a moment of desperation, attempted to run across the room in the direction of the staircase, but had been caught at the chains, which he clung to till beaten off by his uncle.

"I can stand this no longer," said Frank, and without further attempt at concealment he entered the room, with Josiah cleaving to him as a shadow. The miller had neither eyes nor ears for anything save the ghostly sights and sounds which possessed his fancy. Frank and Josiah had scarcely entered the room when he made as if he were dragging a body from the chains into the middle of the room toward the staircase. Here he flung his ghostly burden down, and stood for a moment peering down into the darkness.

Frank came forward, and, taking him by the collar of the coat, pulled him round, and looking sternly into his face, said:

"Miller, thou art the man!"

It was well that the grasp by which he held him was firm, otherwise the old man would have toppled over, and fallen where he had thrown his nephew ten years ago. But Frank held him as in a vice. His face when turned round to the light was still distorted by the passion that possessed him. His eyes were bloodshot, his forehead was set in a deed frown, and his dry lips slowly opened over his firmly set teeth. When his eyes met Frank's and turned with quick inquiry to the figure which stood a little in the background, a remarkable transformation was effected. The strength passion had lent him had faded from his face. His arms fell limp at his side, his knees bent under

him, and he fell a nerveless heap at Frank's feet.

"Get up and come away from this," Frank said. But the miller made no sign either of speech or motion.

"I expect he has fainted; bring me the light."

Josiah brought the lantern which, turned on the face of the old man, left no doubt of what had happened. The stroke, long pending, had fallen, and the miller lay dumb and helpless on the spot whence he had rolled over the still living body of his nephew.

"We must get him home somehow," said Frank, no longer gruff in voice and stern in manner. "It will be a great shock to Mary, but it will, for the present at least, serve to explain everything, and we can think over what must follow."

They carried the lifeless figure of the miller home through the blinding snow, and for the second time within the history of the little household a poor wreck of humanity, speechless and motionless, was carried up the narrow staircase and laid on a bed, from which it was only once more to be lifted out.

VII.

All the village went to the funeral, for the miller was always popular, being esteemed and feared in the earlier days, when a naturally ungovernable temper occasionally got the better of him, and loved and respected in later years, when in the shadow of his great sorrow he had fought against human infirmity, and gloriously overcome it. Mary would not leave the house whilst the dead body lay in it, or even after, when everyone said she ought to go for change.

The miller had left her the whole of his property, and it seemed to her that she would be best respecting his wishes by remaining where she was, and as far as possible allowing things to go on as before. Frank and Josiah spent their last night in the cottage on the eve of the funeral. Frank reproduced his pipe, and fell into his old habit of sitting contemplative before the fire.

"You will be off in the morning, old man," he said, after one of his eloquent pauses, and I am afraid you will not regard your holiday down here as either lively or refreshing. There is one word I want to say to you, though. I daresay your good sense would have forestalled it. Let the secret go into the grave where these two will lie together. That was a point which I confess gave me a good deal of trouble. It was of course natural that the miller should be buried in his own grave, though the notion that he was thus to find quiet companionship with his nephew was at first very revolting to me. But I see more clearly now the measure of his guilt. I doubt even whether, if all the circumstances had been placed before a jury as clearly as they were brought under our eyes, they would have called the crime murder, and would not gladly have availed themselves of the opportunity of bringing in a verdict of manslaughter. I think it is clear that Jack, whom I have good reason to know shared his uncle's violent temper, struck him first and the blows that followed were dealt in a fury of passion, free at least from the guilt of premeditated murder. Since then he has lived ten years, which I believe has been one long unceasing pang of remorse. Day and night he has fought against the domination of that temper which led him into crime. I expect that on Sunday he had been brooding over the anniversary, and his brain, temporarily at least, giving way, the failure had been accompanied by a paroxysm of passion in which he once more went through the fearful scene. Jack's death is almost forgotten. The miller's hand in it is unsuspected. No innocent person has suffered by his escape, and since no good, but only infinite pain, would come of the discovery, let us bury our knowledge of it in the grave where we shall lay the old man in the morning."

"And what about Mary?"

"I am going away in the morning as soon as the funeral is over," said Frank abruptly, and Josiah recognized in the tone a bar to further conversation.

Frank went away as he said, but there is reason to believe that at some subsequent time he must have returned. At any rate it would not be reasonable to suppose, from all we know of her character, that the miller's niece would have followed him to London. What is certain is that Josiah is a constant visitor at a house of red-brick frontage and Elizabethan design, built not a mile and a half from Hampstead Heath. Here lives the miller's niece, now known as Mrs. Frank Fisher, the happy wife of the distinguished artist whose picture, "Sunset at the Mill,"

will be remembered as the great attraction at the Academy last year.

They must have been married some time too, for Josiah has twice had an opportunity of severally renouncing the devil and all his works on behalf two small atoms of humanity set forth in lace frills. They were both boys and the first was of course christened Frank. With respect to the second, Mary, thinking kindly of many years' kindness in far-off times, would have had the lad named Alfred.

"Dear uncle would have been so fond of him if he had been alive to know him," she said, with softly glistening eyes.

But somehow or other Frank objected to this name, protesting that, for unaccountable reasons, he had never been able to bear it. He suggested Josiah, a proposal against which Mrs. Frank Fisher at first turned up her pretty nose. But she relented when Frank told her, even with unnecessary enlargement, how Josiah had pleaded her cause in times past. "He was a perfect nuisance with his 'What about Mary?' 'What will Mary think of this?' and 'Won't you go down on your knees and implore her to marry?'"

So they called the babe Josiah.—*Belgravia.*

Josh Billings' Philosophy.

If you will sit down and wait yung man, at least one half ov the good things ov life will at some time eddy around near yu, while the more yu chase them the more they will break into a run.

All ov natur's works are a part ov a perfekshun of a plan. She makes no mistakes, creates no vacancies, and guesses at nothing.

Ideas are what wins, but if a man hain't got but one, he is very apt to run that one into the ground, and take himself along with it.

Laffer proves nothing. Wise men laff, and ideats grin all the time.

Cunning iz a weak imitashun of wisdom, and iz liable at enny time to merge into fraud.

Happiness haz no abiding place, but often is very near at hand, like the old woman's spektakles. After hunting for them hi and lo, she found them at last safe on her noze.

Gravity iz becoming to a phool at all times, but only to a wise man on state ockashuns.

Very menny seek knowledge, not so much for the truth as for the spekulashun there iz in it.

Heroizm iz simple, and yet it iz rare. Every one who does the best they ken is a hero.

Buty is a dangerous gift. The vanity it inspires, and the base flattery it attrakts its possessors, are not to be envied.

Charity makes no mistakes that she kan be charged with.

Good breeding iz the only thing that kan make a fool enduring.

Servitude iz so unnatural that an honest servant iz the rarest of all things.

There iz great art in knowing how to give without creating an obligation.

As selfish and ill-bred as the mass of mankind are, I prefer to live with them rather than go into solitude and try to live with myself.

Gratitude is a word that you will find in the dictionary, but you will not find much of it anywhere else.

If a man haz got the right kind of religion he kan pick up a creed ennywhere that will fit it.

A true friend iz one whom you kan chide for his faults, without giving offense, and who, without giving offense, kan chide yu.

Nature haz never made ennything perfekt, and she luvs variety so well that shenever has made enny two things just alike.

Indolence iz a quiet malady, but it haz eat up more foundashuns and tipt over more superstruktures than wild ambishun ever has.

Abstinence should be the excepshun and temperance the rule.

Glasgow Flour and Grain Trade.

Dunlop Bros., of Glasgow, importers of and dealers in flour and grain send us their trade circular bearing date Dec. 31, 1881, from which we make the following extract which American millers will read with interest:

It will be found on comparing Prices, that, despite the very indifferent harvest again reaped in England, and the undoubted shortness of the American crop of 1881, the ordinary runs of wheat are only about 2s 3d. per 240 lbs., and flour 3s. to 4s. per 280 lbs. higher than they were this time last year; the upper grades of Hungarian flour and Minnesota Patents being indeed a trifle lower. Bread, it may be mentioned, sells to-day at 7d. to 8½d. per 4 lbs., according to quality, as against 6d. to 8d. last year. American Hard Spring Wheat, it will be seen, keeps dearer

than White or Red Winter, doubtless on account of its comparative scarcity and the favor shown to it by those City Millers who have adopted the Roller System. Indian Corn is 1s. and 3d. per 280 lbs. dearer; Pease unchanged; Scotch Beans and Barley are 1s. and 2s. 6d. respectively lower than the previous year. The other articles of the Trade show little variation.

Regarding the year's imports—while wheat is fully 40,000 qrs. less, flour is 207,000 sacks of 280 lbs. Indian Corn 27,000 qrs., and Barley 25,000 qrs. more than in 1880. Oats, Oatmeal, Beans, and Pease show a considerable falling off. As to the sources of this year's wheat supply, America and Canada together contribute fully 94 per cent., the balance being made up by Russian, Australian, and native sorts. Indian Wheat, although very largely imported by the leading English markets, has not attracted our buyers here, on account of its indifferent strength and flavor. Flour this year shows an import equal to no less than 1,393,295 sacks of 280 lbs., or an average weekly supply of 26,800 sacks. America and Canada, as before, supplied about 76 per cent. of this, while Hungary Austria, Russia, Germany, California, &c., furnished the balance. A closer study of these returns would show that this market continues to attract supplies of the very highest quality of flour manufactured at the chief centres of production at home and abroad.

As to Exports, it will be found that they largely exceed those of the past year in Wheat, Flour, and Indian Corn; and that, while making due allowance for "through traffic," they indicate that the North of Ireland and the South and West Coasts of Scotland continue to draw from the Glasgow Market liberal supplies of the leading articles of the trade.

With regard to present Stocks, with the exception of Flour, which is unusually heavy, all the other articles are moderate. The relation which they bear to last year's stock is as follows:—Wheat is about 17,000 qrs., Flour nearly 101,000 sacks per 280 lbs., Indian Corn about 45,000 qrs., and Pease 7,000 qrs. more; while Beans are 2,000 qrs., Oats 9,000 qrs., and Oatmeal 16,000 loads less than they were then.

It remains to be said that receipts have fallen off within the past week or two; that contrary to experience the demand has revived during the holiday season; and that we enter upon the new year with prices having a decidedly upward tendency.

Reported Fusion of the Buda Pesth Mills.

One of the Vienna journals professes to be informed that the Bontoux group of operators has the plan of forming a union of all the Buda Pesth mills into one great Hungarian milling establishment. As regards this transaction it is said that the negotiations are already far advanced, and those mills which are in the possession of the Hungarian Credit Bank would, as it were, form the groundwork of the undertaking. The Hungarian Land Bank is said to have made so favorable an offer for these mills in the name of the Bontoux group that probably no long delay will take place in the transaction. We, however, give this communication under all reserve, as the fusion of the Buda Pesth mills appears to us very improbable. Even after the purchase of the mills of the Hungarian Credit Bank by the Land Bank, such a complete union seems to be still far afield.—*Oesterreich Ungarische Mueller Zeitung.*

Items of Interest.

PATENTS IN TURKEY.—General patent laws have been lately passed and promulgated in Turkey and Liberia. The Turkish patent law is substantially a copy of the French and German systems. Any person may take a patent on deposit of drawings and specifications. Longest term of patent, fifteen years; annual tax, \$18. The invention must be worked within two years from the date of patent. The penalties for infringement and the proceedings are the same as in all European countries. In Liberia the patentee must be the inventor, or must have lawfully acquired the invention from the inventor. Drawings and specifications must be furnished. The government fee is \$50. The invention must be worked within three years after the grant of the patent.

PAPER BELTING.—At the exhibition now being held in Japan, an interesting feature is the successful use, in the machinery hall, of paper belting. The Japanese have long been celebrated for their manufacture of some exceedingly tough descriptions of paper, and it is stated that the paper belting has been tested and found much stronger than ordinary leather. Now that machinery is rapidly making its way into Japan, the manufacture of this paper belting is of special interest to the country, as from want of proper tanning, good leather is not made by the Japanese.

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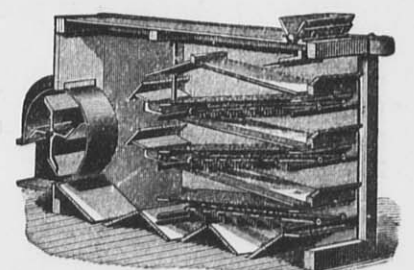
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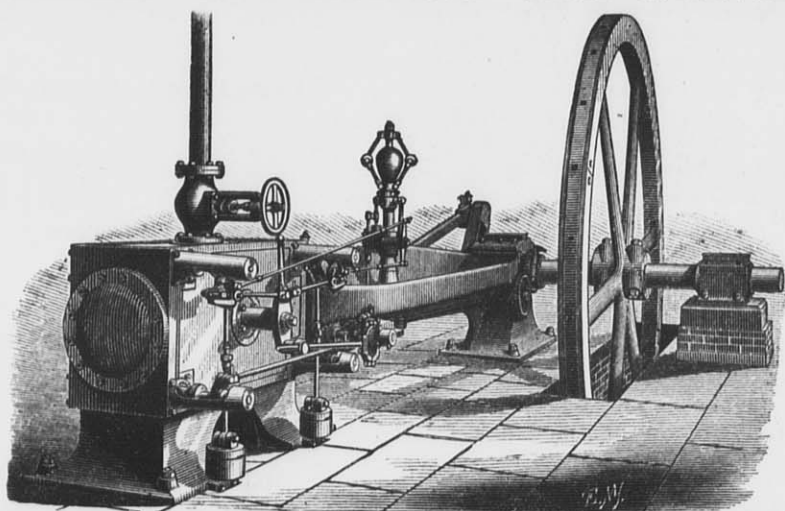
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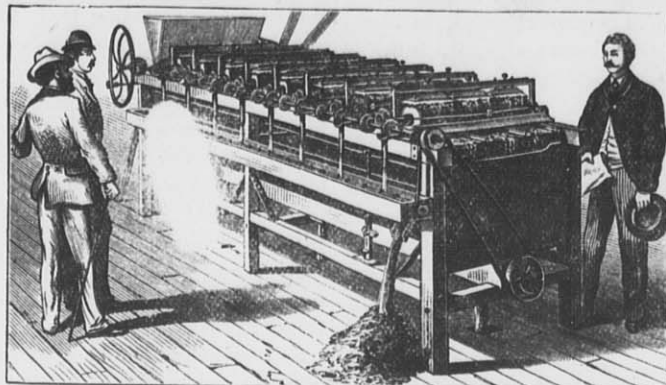
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SOMETHING NEW.

A Combination Electric Purifier—A Complete System of Three Purifiers in One.

Samples of work will be sent upon application, by mail, and all inquiries answered from the New York Office. Parties contemplating building new mills, or reconstructing old ones, should see the superior working of the ELECTRIC SYSTEM before making contracts for Purifiers elsewhere.

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Manufacturers and Agents for the Northwest.

GEO. G. SMITH, San Francisco, Cal.,

Manufacturer and Agent for the Pacific Slope.

JAMES E. LOOMIS, St. Louis, Mo.,

General Western Agent.

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RICHMOND MANUFACTURING CO.,

LOCKPORT, N. Y.,

Manufacturers of

RICHMOND'S CELEBRATED

Smut Machines,

Brush Machines,

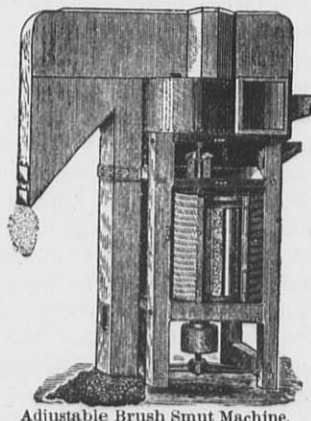
Grain Separators,

and Bran Dusters.

Nearly Two Hundred of these Machines are now in operation in the city of Minneapolis, Minn., alone, and more than sixty in the city of Milwaukee, Wis. They are also extensively used in many other sections, both on Winter and Spring Wheat.

SEND FOR DESCRIPTIVE CATALOGUE.

[Mention this paper when you write.]



Adjustable Brush Smut Machine.

HARRIS-CORLISS ENGINE.

—BUILT BY—

WM. A. HARRIS, Providence, R. I.

Built under their original patents until their expiration. Improvements since added: "STOP MOTION ON REGULATOR," prevents engine from running away; "SELF-PACKING VALVE STEMS" (two patents), dispenses with four stuffing boxes; "RECESSED VALVE SEATS" prevent the wearing of shoulders on seats, and remedying a troublesome defect in other Corliss Engines, "BABBITT & HARRIS' PISTON PACKING" (two patents). "DRIP COLLECTING DEVICES" (one patent). Also in "General Construction" and "Superior Workmanship."

The BEST and MOST WORKMANLIKE form of the Corliss Engine now in the market, substantially built, of the best materials, and in both Condensing and Non-Condensing forms.

The Condensing Engine will save from 25 to 35 per cent. of fuel, or add a like amount to the power and consume no more fuel. Small parts are made in quantities and inter-changeable, and kept in stock, for the convenience of repairs and to be placed on new work ordered at short notice.

NO OTHER engine builder has authority to state that he can furnish this engine. The ONLY WORKS where this engine can be obtained are at PROVIDENCE, R. I., no outside parties being licensed.

WM. A. HARRIS, Proprietor.

[Mention this paper when you write us.]

The Fire Hazard of Flour Mills.

A PRIZE ESSAY BY ERNEST C. JOHNSON.

Read before the Northwestern Underwriters' Association
Chicago, Sept. 14.

(Continued from page 23, December number.)

Spontaneous combustion has not yet been charged with its share of flour mill fires; and has not been sufficiently guarded against. An able writer recently stated that 87 per cent. of the flour mill fires in this field, during four years and seven months, occurred at night; and called for scientific scrutiny of such as broke out beyond two hours after closing mill. Investigations of both American and foreign mill fire reports, prove that per cent. to be nearly an average, though probably 90 per cent. would not be excessive, with a majority occurring from 6 to 24 hours after closing the mill. This excessive night burning can be quite largely accounted for in two insufficiently considered and exceedingly ignitious sources. 1. As stated above, from smoldering fire under the pulley in an elevator head. 2. From spontaneous combustion in mill dust, smut, or product, from one of the several causes incidental. 3. Among the known causes of such ignitions is dampness and mill grease in smut, dust, bran, middlings, shipping stuff, and mill sweepings. 4. The liability of grease from mill gearing, unnoticed dust balls formed by oil drops, or dampness, in product of all kind to heat and ignite voluntarily, render mill sweepings and mill dustings exceedingly perilous. 5. These should always be removed from the mill, and never put in feed bins. 6. A four-inch metal tube, run from basement to top of mill, with a covered flat funnel entry to it on each floor, would be a labor-saving device, through which to send sweepings to a metal dust truck in basement, so connected that dust will not escape while using. By this means, sweepings can be disposed off without the usual attending nuisance. 7. Fire had been scented for several days, in a mill at St. Charles; persistent search had been made for heated journals, high and low, but failed to show cause; a mill inspector readily found the fire, size of a foot ball, in the center of a bran heap; the cause, a slight leak in the roof above, admitting occasional, unnoticed, drops of water during rain. 8. A similar consternation and suspense was caused in an Alton mill. When discovered, it was a ball of fire in the middlings bin, caused by a few drops of oil from a shaft above. The smell of fire was apparent in a mill near London, at 5 p. m. Persistent search was made, but it was not found until 8 o'clock p. m. It was small; in the dust house in the mill, but blazed when the door was opened. It could not have come from other than spontaneous combustion. 9. Doubtless all mill products, subjected to similar conditions, will produce the same results. 10. The degree of danger from this source is measured only by contingencies and combinations which may produce these conditions. 11. Prof. Peck states, in his report, that "All sorts of flour dust absorb moisture very rapidly." 12. Experience shows this to be equally true of all flour mill products. 13. A brush machine, at Princeton, Ill., had clogged and was idle; on opening it two hours later, bunches of smut, fist size, on the wire screen, were found to be evenly saturated, nearly wet, with dampness. The venerable miller said he had never seen a similar instance before. It was doubtless produced by cooler air being drawn through the heated machine, and condensed in the dust. This would indicate that to be entirely safe, after running, the dust should not only be taken away from, but out of such machines. 14. The chop left in elevator cups will sometimes absorb a great degree of moisture, probably from air drawing through them in equalizing temperature. The large number of mill fires during the cooler part of the year, when greater difference of temperature promotes condensation, may be partially accounted for from these sources. 15. During the winter season, a miller at Westville, Ind., found a fire in the saw-dust packing around the water heater. He had cased up and packed the heater about with saw-dust, to keep out frost. It was detached from furnace heat, and the water was warmed only by the exhaust steam passing through it. It could not have been ignited from other than spontaneous heat in dampened saw-dust. 16. Prof. Peck states, as a result of his dust explosion tests, that "after several explosions in the above boxes, in rapid succession, the dust became very hot. In this condition particles formed into loose bundles, about the size of a pea, which not only smoldered, but actually blazed enough to set the sides of the box on fire." He does not say whether the

"very hot" condition was spontaneous ignition, or simply sustained combustion; it seems probably that it was from the former, since the continuation of the combustion, from artificial origin, would hardly be noteworthy. 17. Broken window-panes, and other defects of structure, are frequent promoters of these conditions known to have caused spontaneous ignition. 18. Finally, the conditions that produce and promote dampness in mill products, and combinations that arouse latent heat, are numerous; and the established fact that, with other conditions favoring, such as shutting up the day heat in the mill, and reactions of temperature, these products will heat and ignite voluntarily, renders spontaneous combustion a most prolific source of peril in flour mills. This fact, more than any other cause, accounts for the excessive number of long deferred and mysterious mill fires.

The American Miller, which furnishes much valuable information for insurers as well as millers, in commenting on *The Chronicle* loss tables, says: "Fully twenty-five per cent. of the flour mill fires occurring in the United States, in the past five years, are directly traceable to friction of machinery. In nearly fifty per cent. of the fires, the cause is unknown. Some few of these latter may be charged to the account of spontaneous ignition of oily waste, fermenting bran, and such articles; some others, to incendiarism, and others still, to dust fires; but in our estimation, a very large per cent. of these fires, whose causes are not ascertainable, can also be referred to friction."

There is no fire contingency, of common-sense existence, that is so difficult to establish a belief in generally, as that of the prevalence of spontaneous combustion. Incendiarism that are often seen in action are early admitted and provided against; but such as are induced by molecular changes, reactions, and elective affinity, to which the night season is especially conducive, are less believed, and more nearly approximate unknown hazard, than others, because only the results are discovered.

To be warned by the experience and calamities of others, and thereby avert danger, is better than experience itself in such matters. However, in the absence of faith in such contingencies, thanks to inventive genius, there are provided efficient automatic detectors, and ignipotent devices; if millers will adopt these, of approved form and number, insurers can safely afford to excuse their unbelief.

External exposures add fully twenty per cent. more to the fire rate of this class, on account of the quantity and combustibility of dust discharged from mills, than to most any other hazard. These should be carefully noted, on unprotected sides, and rates computed accordingly.

Modern flour mills require a vast amount of ventilation, and the air should be as pure as possible. This fact renders their location centrally in large cities, and in the vicinity of smoke producing factories, very unfavorable. The head miller of a 500 bbl. city mill states that the waste occasioned his mill from this source is at least 30 lbs. per hour, or about four barrels a day, besides affecting the quality of the output more or less.

With this array of contingencies, incident to flour milling, it would seem unnecessary to look to any other source to explain the vast number of mill fires. However, this does not include all of their inherent hazards; though, if perfect, it would recite the predominating causes. There are the incendiaries, nimical and speculative, which help to schedule a higher rate of premium for all mills, since a proper rate is necessarily calculated on the proportion that all losses bear to the aggregate value.

It would seem due to the legitimate milling interest that insurers ascertain the conditions most liable to produce inimical and speculative hazard, and either avoid such entirely, or charge specifically for them, where they exist, rather than tax the whole enterprise with what is not common to it. This is earnestly sought by insurers, and were it definitely ascertainable, both millers and insurers would be equally benefited by it.

The jealous competitor, the revengeful wronged, the vicious ex-lessee, or the discharged employe, often becomes the incendiary inimical. A good watchman protection of the exterior from easy approach and against ready combustion, and a proper amount of insurance, are safeguards against this incendiary.

The disappointed purchaser, the unsuccessful miller, the fated speculator, or the

financially bankrupt owner of a heavily incumbered mill property, might become the incendiary speculative. However, it is not the heavy, but the increasingly heavy incumbrance, that hurts; which, if nothing more, will prevent proper repairs and increase carelessness. Heaven bless the man of energy and pluck, who, having mastered this intricate science, and established local credit, has the nerve and enterprise to realize on his industriously obtained skill, by staking his ability against an interest-accruing loan. Having computed results, such an incumbrance on mill property is not a hazard. Outside speculation, deficient milling experience, a neglected business, or a neglected and depreciating property, attended with incumbrance, are prolific incentives to incendiarism, directly or indirectly.

Grading in Milling.

One of the salient points in new ideas of milling is the prominence which is given to the grading and separate handling of products. Millers are growing more and more to believe that division and separation of products is essential to obtaining the highest results. It is this separate classifying and handling of products that is the distinctive feature of Hungarian milling aside from the gradual reduction of the wheat. Of course there are shades of difference in the classes of middlings so small that they can safely be ignored; but this cannot disprove the general principle that the proper grading of products is one of the essential features of good milling; it is only the carrying the principle too far that it becomes a useless complication instead of a benefit.

By whatever system of gradual reduction the wheat is reduced to middlings, it is safe to say that a grading reel should be used to separate the grains from the small grains, and that the first reduction or cracking of the wheat should be made on these two grades separately. It makes little difference what instrumentality is used, so far as the propriety of the grading is concerned. No machine will crack or break small and large grains alike. If set to break the large grains, the smaller ones will escape either whole or insufficiently broken; while conversely, if the machine is adjusted to break the small grains it cannot help flouring the large grains more than is desirable.

So, too, with the middlings. The importance of dividing the middlings into grades and purifying them separately, cannot but be apparent on reflection. Purifier makers have perceived the desirability of this to some extent and made their machines conform more or less to this idea. But where it is possible the middlings should be graded and purified on separate machines. This is the most satisfactory method to all concerned, as any machine will do better work on a uniform grade of middlings than when the material is of different classes. Just how many grades of middlings it is desirable to make is a question which every miller can best settle for himself. Three or four grades are probably as many as it is desirable to make and handle; for here the field widens and the possibilities of expansion become manifest. So, too, how to handle these middlings after they are purified, is a question which is now engaging the attention of our millers, and here opinion differs. Many millers advocate the gradual reduction of middlings the same as the gradual reduction of wheat, making, however, only three reductions, thus: reducing or breaking down the coarse middlings, making flour, and one or two grades of middlings, say medium and fine, then reducing the medium middlings to flour and very fine middlings, and the latter from all sources, by itself. The possible variations of separation, purification and reduction of the middlings are almost infinite, and every miller will in the end determine just how far this division and separate handling of products can be carried with advantage and convenience to himself. —American Miller.

Grain and Flour Trade Notes.

An indication of the continued falling off in Hungary's export trade in flour is furnished by the recent official account of the exports from Trieste. In November only 6,245 sacks were sent to Great Britain, against 26,190 sacks in November last year; whilst for the Brazils 2,420 bbls were exported, against 11,130 bbls in November last year.

The following three items are from an esteemed English contemporary, *The Millers' Gazette and Corn Trade Journal*, which has since its change of name (transposition,

rather) shown itself full of enterprise and good taste.

ODESSA is desirous of organizing itself *a la mode Americaine*. A commercial society is, in fact being started there which has for its object the receiving of agricultural products from the interior of South Russia, and the re-selling of the same to the best advantage for the producer. It is in fact a sort of co-operative farmers' society. The directors of the society are to be composed of several large capitalists and representatives nominated by the farmers themselves. The construction of the warehouses and elevators, and all the necessary apparatus, will be according to the latest and most improved American system, in the copying of which Odessa will certainly make one important step in the path of progress.

THE CULTIVATION OF ENGLISH WHEAT IN GERMANY.—The Association of German millers has, in the journal of the Association at Nassau, inserted an article against the culture of English rough wheat. It is alleged that through its extensive cultivation arises a general agricultural loss, as this grain contains much less human nourishment than the local wheat. The flour from the English rough wheat, if used alone, is not fit for baking, but only for starch manufacturing. Millers, who know the wheat, will not buy it even at very low prices, and the Hamburg Produce Exchange decided to exclude it from the 1st of June, 1881, from delivery. Finally the association warns farmers against the cultivation of English wheat, in order to keep up the well-deserved reputation of the home-grown wheat, and to preserve agriculture and the milling industry from an inevitable loss.

NATIONAL ASSOCIATION OF BRITISH AND IRISH MILLERS.—We understand that arrangements are now completed for the meeting of the representative committee appointed by the local branches of the Association, with Mr. Thomas Muir and Dr. King on behalf of the Germ Milling Company, Limited, at the offices of the Association in London, on Thursday week, the 12th inst., and we hope that their report will be ready to present to the council which meets on Monday, the 16th. We are also informed by Mr. Chatterton, the secretary that in all probability the next General Meeting of the Association will be held at the Baker's Hall, Harp Lane, London, on Monday, the 13th February, when Mr. George Pawsey Witt, of the firm of Corcoran, Witt & Co., will read a paper on their Modified Roller Mill System in combination with their new patent degumming roller. Mr. Chatterton will read the report furnished by the Board of Trade to the Home Secretary on the recent flour mill explosion at Macclesfield, and Mr. Potts, of Sunderland, will read a paper on the Rating of Flour Mills.

NEWS.**Everybody Reads This.**

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

DIED.—Mason Parker, miller, at Wadeville, N. C.

BURNED.—A. E. West's flour mill at Hazleton, Ind.

BURNED.—Scott's flour mill, at Elbar, N. Y. Insured.

A 300 barrel roller flour mill is to be built at Perham, Minn.

Bottkel Bros. are preparing to build a mill at Brussels, Wis.

CHICAGO now has a grain storage capacity of 20,000,000 bushels.

Cook & Sackett is the name of the new milling firm at Watkins, N. Y.

JOHN SCHALL's roller mill at Allentown, Pa., is expected to start up Feb. 1st.

There are fifty-five cotton mills in Georgia, and others in process of erection.

The mills of Clement & Stevens, at Neenah Wis., now use rollers exclusively

H. D. Perry, miller, of the firm of Johnson, Perry & Co., Milford, Neb., is dead.

The grist mill at Cambridge, Me., has been putting in some straight work lately.

The new steam flouring mill at Calhoun, Ga., will soon start up on custom work.

It is said that twenty-seven of the exhibitors at Atlanta are going to establish factories there.

The Columbus Roller Flour Mill Co. will build a 200 barrel mill this year, at Columbus, Iowa.

The Quincy, Ill., flour mills manufactured during the year 1881 about 400,000 barrels of flour.

Eastern millers are commencing to pay more attention than ever to improving their mills.

NEENAH is the second milling city in Wisconsin, Milwaukee only surpassing her in that respect.

THE West Liberty, Ky. flouring mills burned January 12th. Loss, \$10,000; no insurance.

Gilman Conner, one of the earliest millwrights in Minneapolis, died recently of pneumonia.

It is said that preparations are being made to rebuild the mill recently destroyed by fire at Minneapolis.

The new Wabash grain elevator in Chicago is just completed. Cost, \$400,000; capacity, 1,700,000 bushels.

Stewart & Wood's mill, at Bellaire, O., is being remodeled, and will have a capacity of 75 barrels per day.

MR. CAMMERY, of Cedar Creek, Lehigh county, Pa., expects to put up a grist mill at that place next spring.

The firm of Simpson & Gault, Cincinnati, O., will hereafter be known as the Simpson-Gault Manufacturing Co.

John Hoover now owns and operates the mill at Provo, Utah, formerly belonging to George Beebe, deceased.

MESSRS. S. C. HURT & Co., of Lynchburgh, Va., have purchased a new turbine for their "Piedmont Mills" at that city.

THOS. MIGHTON has put a new purifier into his mill at Chardon, O. Wolf & Hamaker, of Allentown, Pa., sold it to him.

THE Garden City Mill Furnishing Co., of Chicago, Ill., report business lively, and they are running full force on full time.

C. & F. NACHTRIEB, Galion, Ohio, are now remodeling their mill and have put in a full line of the Odell double roller mills.

BURNED. — Ferguson, Watkins, & Cornell's flouring mills, at Toledo, Ohio, burned January 6th. Loss, \$10,000; fully insured.

THE works of the Turbine Water Wheel Co., at Orange, Mass., were destroyed by fire, January 24. Loss, \$55,000; insurance, \$26,000.

THE Garden City Mill Furnishing Co., of Chicago, sold during the month of January 98 of the Garden City wheat brush machines.

THE Crescent roller mill at Eau Claire, Wis., owned and operated by the D. Shaw Lumber Co., has a capacity of 200 barrels per day.

The steam flour mills at New Haven, Ind., owned by Hartzell Bros., were destroyed by fire January 7th. Loss \$25,000, and no insurance.

Louis Snider's sons are remodeling their paper mill at Hamilton, O. They will replace their old engine with an Atlas Corliss of 100-horse power.

THE Garden City Mill Furnishing Co., of Chicago, Ill., recently put in eight of their purifiers in Pennypacker & Co.'s Mill, in Philadelphia.

Many Minnesota and Wisconsin mills are having rather dull times on account of the unsatisfactory condition of the wheat, as well as its scarcity.

DURING the year 1881, the Fleming Mills, of Minneapolis, manufactured 3,629,687 barrels of flour, of which 1,288,399 were exported direct to Europe.

THE Garden City Mill Furnishing Co., of Chicago, recently placed ten of their largest size middlings purifiers in Norton & Co.'s mill, in Chicago.

Ex-Gov. Washburn will build a \$125,000 saw-mill at Brainerd, Minn., next spring. It will have a boom large enough to hold 50,000,000 feet of logs.

Quale, Ferguson & Co.'s flour mill at Toledo, O., was damaged by fire January 7th to the extent of \$10,000. Fully insured in eastern and foreign companies.

The new Indianapolis steel rail mill will put in seven new boilers, 48 feet in diameter and 28 feet long, to be furnished by the Atlas engine works, of Indianapolis.

Cherry, O'Connor & Co., the well known contractors, of Nashville, Tenn., have placed an order with the Atlas engine works, of Indianapolis, for a 20x48 Corliss engine.

American theatre-goers have of late laughed themselves sore at the absurdities of "Samuel von Posen," and now comes the news that the great miller von Posen has failed for the snug sum of \$250,000.

A new mill is being built at Burnt Prairie, by Holmes & Young, formerly of Enfield, same state. They are having the machinery

made for them by Nordyke & Marmon Co., of Indianapolis, Ind.

Nordyke & Marmon Co., of Indianapolis, Ind., have received a contract to manufacture the entire machinery for a two-run custom mill at Evansville, Ark., for Messrs. McCormick & Littlejohn.

THE first shipment of wheat for the new flouring mills at Attica, N. Y., was received Jan. 23. The mills have a capacity of 300 barrels per day and are driven by a 140 horse power engine.

McCullough & Hollister are about to build a three-run mill driven by an engine, at Hepler, Kan., and Nordyke & Marmon Co., of Indianapolis, Ind., are manufacturing the machinery for them.

In North Carolina there are fifty-three cotton mills in operation, and six others are in progress and nearly completed. There are also four or five woolen mills in operation in "the old North State."

The Scoville Manufacturing Co., Waterbury, Conn., are putting in a new 26-inch Harris-Corliss engine, and making large additions to their shop area, to accommodate their rapidly growing business.

Boile, White & Co., of Chicago, are extending their already large saw-mill business in Tennessee, and have ordered a complete 50 horse power engine and boiler outfit of the Atlas engine works, of Indianapolis.

J. M. Veach & Co., of Adairsville, Ga., are building a new mill, and will put in a 14x42 Atlas Corliss engine and a pair of boilers to furnish power. The entire outfit will be furnished by the Atlas engine works, of Indianapolis.

THE Garden City Mill Furnishing Co., of Chicago, shipped, on orders, one of their Wheat Brush machines to Australia, and another to Constantinople, the last order being through the advertisement in the UNITED STATES MILLER.

The Brooklyn and San-Miguel Mining and Reduction Co. have ordered a complete steam outfit from the Atlas engine works, of Indianapolis, consisting of a 14x20 Atlas engine, with a pair of 40x18-ft. boilers, for their mines at Columbia, Col.

Elias Faylor & Co. have commenced the erection of a 150-barrel roller mill, operating on the gradual reduction system, at Rich Hill, Mo. Nordyke & Marmon Co., of Indianapolis, Ind., are planning and manufacturing the entire outfit for the same.

C. B. PALMER & Co., Dayton, Ohio, who recently purchased the Dayton View Mills, are making extensive repairs and changing into a roller mill, and putting in a line of the Odell double roller mills. They will be ready to start up in a few days.

Nordyke & Marmon Co., the mill furnishing firm at Indianapolis, shipped and delivered to the various roads in that city almost 1,000 loaded cars, during the year 1881. This does not include local shipments which were delivered to freight depots by wagons.

A barbed wire manufactory is to be erected shortly in Winnipeg, Canada, by a Chicago firm. An American sewing machine firm is also erecting a factory in Scotland. Some fifty English manufacturers have branch mills in America. Things are getting mixed.

The remodeling of the old mill at Pendleton, Ind., have been commenced by the new purchasers, Messrs. Potts & Parker. The improvements are very extensive, making almost an entire new mill. All the new machinery comes from the Nordyke & Marmon works, at Indianapolis, Ind.

In St. Louis there are now building what will be known as "East St. Louis B.," capacity, 900,000 bushels; "Union Depot," capacity, 550,000 bushels; the "Union," increasing to capacity for 1,500,000 bushels; "Advance B.," capacity, 1,000,000 bushels; "Missouri Pacific," capacity, 1,500,000 bushels. When these are completed the capacity in the city will be 11,600,000 bushels.

R. L. Downton has the contract for building an 800 bbl. roller mill at Alton, Ill., for E. O. Stannard & Co., the mill to be ready for running within ninety days of signing the contract, and to be as good as the best modern milling engineers can design and build. The Downton Manufacturing Co. will put in the Cranston-Downton corrugated roll, with Gray's belt drive, paying royalty for the latter, thus giving a very complete machine, fully protected from litigation.

A number of prominent Minneapolitans, backed by ample capital, have formed a new elevator company, the object of which is to own and operate elevators in Minnesota and

Dakota, and the Davidson elevators on the Breckenridge division of the St. Paul, Minneapolis & Manitoba road have already been purchased by the company as a nucleus. The organization will also buy or build other elevators at prominent points, both on this side of and beyond Wahpeton, on that line, and at other points where favorable openings occur. The company is composed of citizens of Minneapolis. It has ample capital, and they propose to run their elevators in a legitimate and business like manner, dealing justly by all. The organization is not yet perfected, but will be immediately, when the names of the incorporators and officers will be made known. — *Minneapolis Tribune.*

The Consumption of American Breadstuffs and Provisions in Europe.

REPORT BY CONSUL BYERS, OF ZURICH.

Before the year 1860, the United States did not export, on an average, more than 4,000,000 cwt. of wheat yearly. Between that date and 1865 the average amount was nearly 15,000,000 cwt., and during the years 1871 to 1875 it ran up to 24,000,000. Then commenced an increase of grain export pronounced by good authority as being absolutely without parallel in the history of commerce.

Our wheat exports reached, in 1876, 29,500,000 cwt.; in 1877, 21,500,000 cwt.; in 1878, 38,500,000 cwt.; in 1879, 65,500,000 cwt.; in 1880, 83,000,000 cwt. During these years, 1876 to 1880, our flour exports had increased from less than 7,000,000 cwt. to 10,500,000 cwt., and the corn we sold went from 24,500,000 to 49,000,000 cwt. Very bad harvests at home and very fair harvests abroad checked the tremendous exports in 1881, but the healthy steadiness with which they have increased, with few exceptions, for the last fifteen years, is a guarantee that the check is temporary only, and that, with favored harvests and increased acreage, our grain exports will become almost fabulous. Better grain lands do not exist in the world, and our people, aided by the millions of industrious farmers coming from Europe, are each year adding vast regions to the hand of the reaper. Our cheap lands and machine cultivation have revolutionized farming over the entire world, and this revolution is a permanent one, waiting only on cheaper methods of transportation to make it still more radical. When our barge systems are completed, and our water-courses made to serve us, and we own lines of great freight-steamers to every foreign sea-port, famine and hunger will be things only of fable and history. Our grain exports do not go so exclusively to England as in former years; there the increase since the year 1860, in wheat alone, has been 58,000,000 bushels. Almost no wheat was bought from us by Belgium in that year, but in the year 1879, 9,000,000 bushels were taken. France commenced in that year (1860) with but 28,000 bushels of American wheat. Nineteen years later she bought of us about 42,000,000 bushels, and the increase in flour and corn sent to that country in those years is yet more marked. With all this, there remain good reasons for supposing that we are only at the beginning of grain-exporting to continental States. Cheap transportation can easily make it possible for us to supply other continental states with the millions of grain they are now buying from abroad, for the increases of their purchases from us have not by any means reached the amount we can yet make them. If wheat bears the cost of transportation even from Australia, Egypt, and Chili, to Europe, and statistics show that it does, there certainly can be no further question as to our furnishing the article at as low a price in any continental harbor.

London now controls the wheat market of Europe; but, on the other hand, her own market is controlled by the wheat-fields of the United States. Of Great Britain's imported wheat last year, 5 per cent. came from Russia, 6 per cent. from India, 8 per cent. from Australia, 7 per cent. from British America, 3 per cent. from Egypt, 3 per cent. from Chili, 3 per cent. from Germany, and 65 per cent. from the United States. There is no good reason why other wheat-buying states should not be supplied from the United States in the same proportion as Great Britain, and there are visible signs that this will soon be effected.

Russia sold 9,000,000 centners of wheat to Great Britain only three years ago; now she sells but little over 2,500,000.

Germany, which furnished Britain with 5,000,000 centners in 1878, furnished her but 1,750,000 in 1880.

There are not fewer than ten European countries which must buy a part of the grain

they consume, and nearly as many are compelled to buy a part of their meat. France imported in 1878 not less than 20,000,000 centners of grain, not a fourth of it coming from the United States, though we increased the amount to about 44,000,000 in 1879.

Little Switzerland imports about 7,000,000 centners of grain yearly, but to the present time almost wholly from Eastern European states, while 117,000,000 francs worth of wheat and corn are bought yearly by Italy, a small proportion only coming from the United States. So, too, is it with Sweden, Portugal, the Netherlands, and Greece, all large buyers of grain and of meat, but not yet buying extensively of the United States. Supposing that Europe continues to produce the same quantities of bread and meat as now, there is still left the numerous markets referred to, to be supplied, and that with amounts which, in their totals, would double the exports we now have. There is no likelihood, however, of production continuing so largely in Europe when it is becoming unprofitable. Cheap labor is counterbalanced by dear land, and the question of American supply has become almost wholly a question of freights.

If with but 32,000,000 acres of land in wheat we can now support 50,000,000 of our own people, and send about 100,000,000 of spare bushels abroad, what will we have for export when all territories of American wheat-land shall stand in golden grain?

Our corn-fields have produced surplus crops for Europe that are scarcely less astounding than the shipments of wheat. From 3,000,000 bushels sent abroad in 1860, the exports had risen to more than 85,000,000 bushels in 1879; and this is supplemented by something like 11,000,000 bushels of rye, barley, and oats furnished to Europe in that year.

The grand complement of these grain exports are the meat, butter and cheese we sell abroad. These necessities of life we export mostly direct to England, but the consumption on the continent is much greater than is usually supposed. We sent directly to English ports in 1879, exclusive of our shiploads of live cattle, &c., not less than 516,000,000 pounds of ham and bacon, 25,000,000 pounds of butter, and 136,000,000 pounds of cheese. Another hundred million pounds of these same articles were sent to other states, mostly in Europe.

It is not so much the enormous amounts of these articles exported that is worthy of attention as it is the steadiness of the increase recently from year to year, showing that this stupendous export of breadstuffs and meats is not based on fictitious circumstances that may speedily change. The price of the native products of the land do not change materially in Europe. The land itself cannot become much cheaper or produce more, nor can farm laborers be expected for less wages than they at present receive. In America land may become dearer, it is true, but in proportion that it becomes dearer will immigration increase its products, while new methods of farming, of slaughtering, packing, preserving, and transporting, will double and treble the capacity of our country for supplying the world cheaply with life's necessities.

The Total Product for 1881.

The secretary of the St. Louis Merchants' Exchange furnishes the following official report of the flour manufactured by the St. Louis mills during the year 1881:

Atlantic (burned August 12), Atlantic Milling Co. owner, 194,425 barrels product.

Park, J. W. Kaufman (run for six and a half months) capacity 800 barrels, 97,951 product.

Anchor, Anchor Mill Co., 800 barrels, 65,000 product.

Eagle, E. O. Stannard & Co., 700 barrels, 159,196 product.

Laclede, Kehlor Bros., 700 barrels, 128,000 product.

Venice, Kehlor Bros., 400 barrels, 43,000 product.

Empire, Empire Mill Co., 600 barrels, 91,442 product.

Victoria, Victoria Mill Co., 500 barrels, 33,375 product.

Phoenix, Atlantic Mill Co., 46,750 product.

Franklin, Geo. P. Plant & Co., 425 barrels, 86,845 product.

Pearl, Geo. P. Plant & Co., 325 barrels, 67,030 product.

Cherry Street, T. L. Johnston & Co., 350 barrels, 51,800 capacity.

Union Steam, Union Steam Mill Co., 450 barrels, 128,150 product.

Camp Spring, Camp Spring Mill Co., 500 barrels, 104,259 product.

Saxony, Saxony Mill Co., 350 barrels, 82,600 product.

United States, E. Goddard & Sons Co., 600 barrels, 56,140 product.

Jefferson, Sessinghaus Bros., 400 barrels, 90,000 product.

Iron Mountain, F. Tiedeman & Co., 500 barrels, 45,675 product.

East St. Louis, Hezel Milling Co., 400 barrels, 78,030 product.

Globe, W. S. Taylor & Co., 150 barrels, 20,600 product.

St. George, H. Kalbfleisch & Co., 200 barrels, 34,385 product.

Carondelet, Lallemand Bros., 18,000 product.

Tuscan, J. L. Price & Co.

Total barrels manufactured, 1,717,629.

Flour manufactured in 1880, 2,077,625 barrels.

Flour manufactured in 1879, 2,142,949 barrels.

The Wheat Crop and Bread Supply of Switzerland.

REPORT BY CONSUL MASON, OF BASEL.

There are in Switzerland no complete official statistics of the annual crops of wheat and other cereals, but trustworthy agricultural authorities have made careful estimates and comparisons from which some approximate and interesting results may be deduced.

During the period from 1868 to 1880, the average annual home crop of wheat was about 4,100,000 centals. During the same period the average yearly import of wheat, flour, rye, and other bread materials was 5,500,000 centals.

The entire annual consumption during that period was therefore about 9,600,000 centals exclusive of the small amount of rye and barley raised at home and used in the manufacture of bread. The population of Switzerland is 2,750,000, a large majority of whom consume comparatively little meat and but few vegetables; so that it is hardly surprising to find the yearly bread consumption of the entire people estimated as high as 306 pounds per capita. This estimate would seem to be somewhat in excess of the fact, since the total 9,600,000 centals of breadstuffs annually consumed includes the large amount eaten by the throng of tourists and visitors, who from June until October inhabit the numerous summer resorts of this country.

The essential fact, however, from the American point of view, is that while Switzerland consumes 9,600,000 centals of breadstuffs, it raises from its own soil only two-fifths of that amount, leaving the remainder to be imported, mainly from the United States, Russia, and Austro-Hungary.

During the past three years European harvests have been generally unfavorable, and during part of this time the exigencies of war and home demand have to some extent checked the supply from Russia; so that the proportion of the entire breadstuff import which has been drawn from the United States has steadily increased.

At the same time the area of wheat culture in Switzerland has rapidly decreased. The uncertainty of the grain yield, and the necessity of securing the utmost annual return from the limited productive area of this country, have constrained a constantly increasing percentage of Swiss farmers to abandon wheat-growing for the more certain and profitable pursuits of dairying and stock-raising. Lands that were uniformly devoted to wheat and rye culture, until railroad facilitated the importation of cheaper American breadstuffs, are now devoted wholly to grazing, fodder crops, potatoes, and the vine.

Meanwhile the use of rye and barley as bread material has rapidly diminished. Laboring people who had eaten black coarse bread on account of its greater cheapness, now find white wheat flour more economical than rye, although it can hardly be said that the white bread is preferred on any other ground than that of economy to the dark loaves to which they had previously been accustomed.

CONCLUSIONS.—1. The wheat crop of Switzerland for 1881 is of excellent quality, and, in proportion to the area harvested, shows some increase over the yield of 1880. But as the wheat area is, for the reasons above stated, rapidly diminishing, the yield of the present season will not exceed, if it equals, the average annual supply of 4,100,000 centals.

2. There will be, therefore, an import demand for about 5,800,000 centals, of which the United States will have an opportunity to supply their usual large proportion, although the more favorable harvests in other European countries this year will enable some of them to offer somewhat more serious competition.

3. It would seem apparent that a systematic and vigorous effort on the part of American wheat and flour exporters to introduce into Switzerland the coarser, darker, and cheaper grade of breadstuffs might develop satisfactory results. The Swiss people, in general, do not prefer white and high grades of flour, but they do insist that their bread shall be wholesome, nutritious, and cheap.

George Motley.

On the 24th of December, 1881, while sitting quietly in his chair, Mr. George Motley, of Rochester, N. Y., suddenly died from an attack of heart disease. He was in his forty seventh year. Mr. Motley was an Englishman by birth. He was a member of the milling firm of Moseley & Motley, and was the inventor of a mechanical device for degumming wheat, now owned by Chisholm Brothers, of Chicago.

The Flour Milling Interest.

The flour milling interest of the country is in a deplorably depressed condition, resulting from two leading causes, the relatively higher cost, through a short crop and speculation, of Wheat than flour, and the over-production of high grades of the latter, which are mainly used for home consumption, and the under-production of the low, or export grades. As a consequence of the excessive supply of the higher grades of Flour, for which it is almost impossible to get back a new dollar for an old one, the flour being on an average fifteen per cent. cheaper than the wheat from which it is made,—a large number of the mills in the principal flouring districts have been obliged to shut down, or suspend work for a season. The primary cause of this glut is the adoption in recent years by the leading millers of the country of the new patent process for converting wheat into flour, whereby a largely increased percentage of the product consists of the finer grades, which cannot all be consumed at home, their high cost being a practical bar to free exportation. While the market has been for a long time over-supplied with the high grades, there has been almost continuously for many months a scarcity of the low or export grades, especially of superfine and No. 2 extra, which are principally sold for exportation. Attention has been so frequently directed to this anomaly, in our review of the market, that the wonder is that the millers have not applied the only remedy possible,—that is, such a change in tactics as to afford a larger percentage of low grades and a lessened percentage of high grades. To this complexion must the milling business come at last, if it hopes to prosper.

In this connection, it is interesting to note the tendency to concentration of the milling interests in fewer districts where superior facilities, such as unlimited water power and accessibility to the great wheat fields, are afforded. This tendency is promoted by the extension of the railroad system and the cheapening of the rates of transportation, which are fully fifty per cent. lower than they were a few years ago. This will explain why Minneapolis, notwithstanding its remoteness from the seaboard, has become the chief centre of the Flouring interest of the country. That young and thrifty city is favored by the finest water power probably in the world, and is moreover the seat of the great Spring Wheat fields of the Northwest. Minneapolis flour mills consume not less than 25,000,000 bushels of Wheat annually. The Minneapolis millers have just organized what is to be known as the Manitoba Elevator Company, the object of which is to insure rapid delivery of Wheat at the mills in their city. This movement is said to have been rendered necessary by the state of the wheat market, but it will not be long before the wheat growing region North and West of Minneapolis will be so vast in area that there will be no difficulty in supplying the mills of that city as promptly as possible with the best wheat grown. This action on the part of the Minneapolis millers is illustrative of the shrewdness and business energy of the men who have built up that prosperous and growing city in the Northwest,—a shrewdness and energy that will no doubt in due time find a remedy for the excessive production of grades of flour for which they cannot at present find a profitable outlet.—N. Y. Commercial and Shipping List.

Grain and Flour Trade Notes.

The average annual wheat crop of Italy is estimated by United States Consul Smith to be about 141,000,000 bushels, and of corn 85,600,000 bushels. A considerable quantity of Neapolitan wheat is exported, and cheaper foreign wheats imported for home consumption.

The total shipments of wheat from California during December were 2,816,437 centals, valued at \$4,670,210.

During the year ending November 30, 1881, there were shipped from the ports of Melbourne, Adelaide and Sydney, to Europe, 3,712,000 bushels of wheat, against 8,488,000 during the previous year, and 81,900 tons of flour, against 73,200 tons the previous year.

An immense mill and bakery is projected in Vienna, and the projectors think they can furnish a good quality of bread at from four to five cents per pound, and still make a reasonable profit.

It has been found that a large portion of the grain stored in New York and Brooklyn warehouses has become badly heated, and the falling off from the grading has been very marked, and is the cause of serious loss. A meeting of the grain trade was held Tuesday, Jan. 24th, at which meeting a committee of

five was appointed by the grain trade to co-operate with the grain committee. It was proposed to have the damaged grain aired, and if necessary transferred to other warehouses. A re-grading of the grain will no doubt be necessary.

In Kansas farmers have been plowing all through the month of December, and it has been the mildest winter ever known. In Missouri there has been no snow, and the ground in southern Illinois is still bare. In Ohio and Indiana the situation is the same.

Messrs. Walker, Sumner & Co., of Detroit, Mich., write to *The Times* as follows: We have compiled the following figures in a very careful manner, and consider them as near correct as is possible, considering the magnitude of the undertaking. While the movement of wheat throughout Michigan since the 1st of August last has been largely discussed, many people seem to have lost sight of the vast milling interests of the state. These people will be astonished when they find that the demand from that forgotten source has exhausted over 5,000,000 bushels of the crop of 1881, or more than twenty per cent. of the estimated yield. There are 734 mills in the state of Michigan, and they have been divided into five classes, as follows: The first, constituting those that have ground 50,000 bushels or over; second class, 20,000 to 50,000 bushels; third class, 10,000 to 20,000 bushels; fourth class, 5,000 to 10,000 bushels, and fifth class, those grinding less than 5,000 bushels. From the recapitulation of these, it was found that

	Bushels
Class 1 comprised 15 mills, which ground.....	1,368,970
Class 2 comprised 26 mills, which ground.....	1,097,385
Class 3 comprised 64 mills, which ground.....	960,420
Class 4 comprised 146 mills, which ground.....	994,160
Class 5 comprised 483 mills, which ground.....	910,540
Total.....	5,331,475

The returns which go to make up this total of 5,331,475 bushels do not in most instances include the wheat ground for farmers' use, or what is called grist work. Add to the above figures 2,800,000 bushels, the amount in round figures received at Detroit since August 1, also 1,500,000 bushels, the estimated amount shipped around Detroit direct to New York and other eastern markets; also 500,000 bushels, the estimated amount shipped from interior points direct to millers in the east, southeast and south, and there is a grand total of 10,100,000 bushels. Thus it will be observed that a very large percentage of the crop has been marketed. Note again the remarks of these numerous millers as to the probable amount in farmers' hands:

Nine report no more wheat in farmers' hands, with the crop very light—not a sufficient amount for home requirements; 127 report at least 50 per cent. marketed; 98 report at least 66 per cent. marketed; 72 report at least 75 per cent. marketed; 428 make no remarks as to the amount back.

An Ingenious Invention.

It is reported that the Reading railroad will introduce a station indicator on passenger trains, the Boynton patent. At each end of the car is an oblong box containing the names of the stations on a ribbon. Over the top of the box is printed "next stop," and the name of the station at which the next stop is to be made shows through an opening in the door of the box. The shifting of the names is controlled by the engineer on the locomotive. There is a small rubber bellows in each box which is contracted when the engineer makes a vacuum; this works a lever that raises a platform on which the band containing the names of the stations rests. An ingenious catch prevents the band from slipping backward, so when the platform falls again by the bellows filling with air the band must fall to the front, thus shifting the name of the station passed to the next one above it. The engineer has a small indicator in the locomotive cab, bearing the names of the stations and he thus knows whether the apparatus is set right. The indicator can also be worked by the Westinghouse automatic brake cylinder or by a bell cord.

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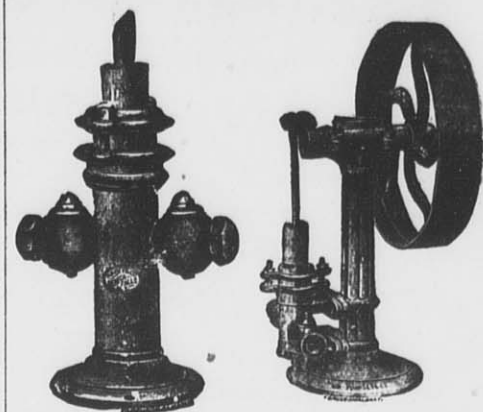
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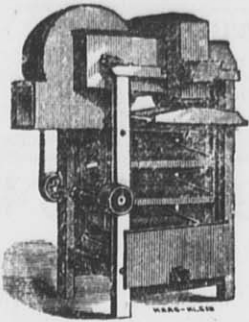
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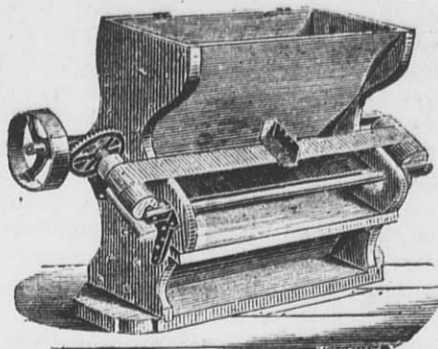
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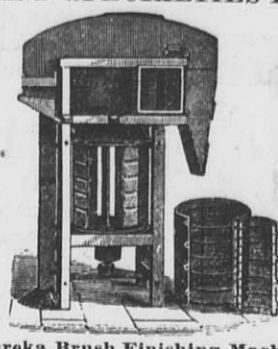
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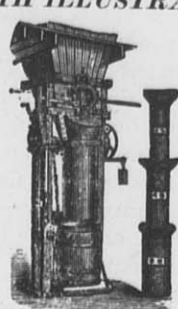
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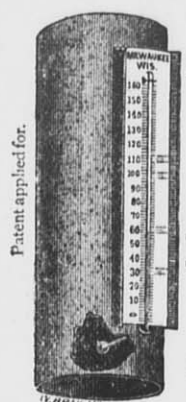
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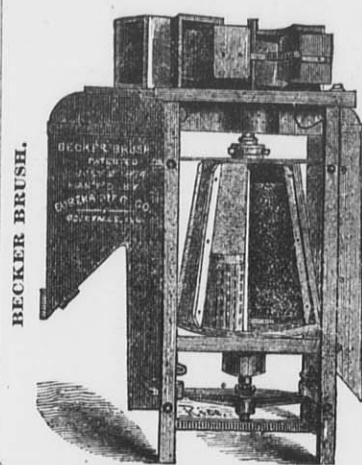
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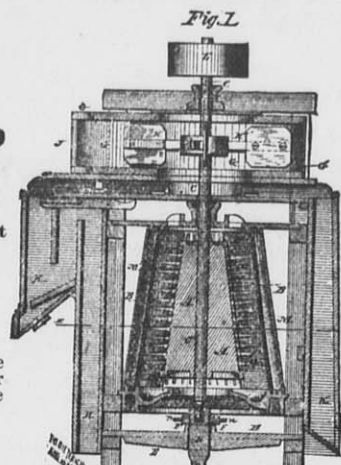
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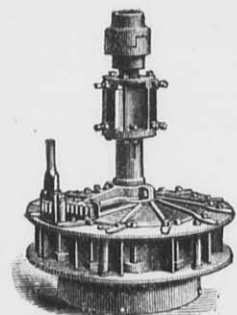
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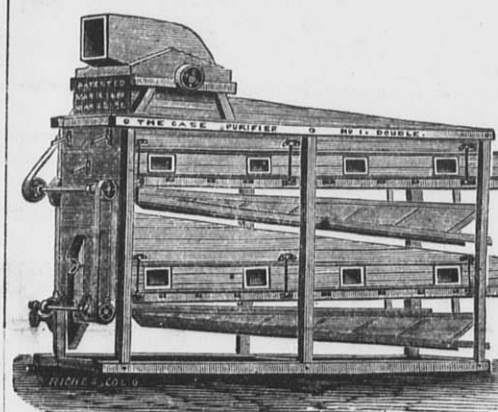
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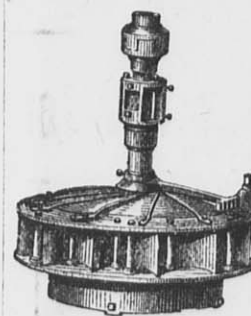
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[Parties corresponding will please state where they saw this advertisement.]

WEGMANN'S PATENT PORCELAIN ROLLS

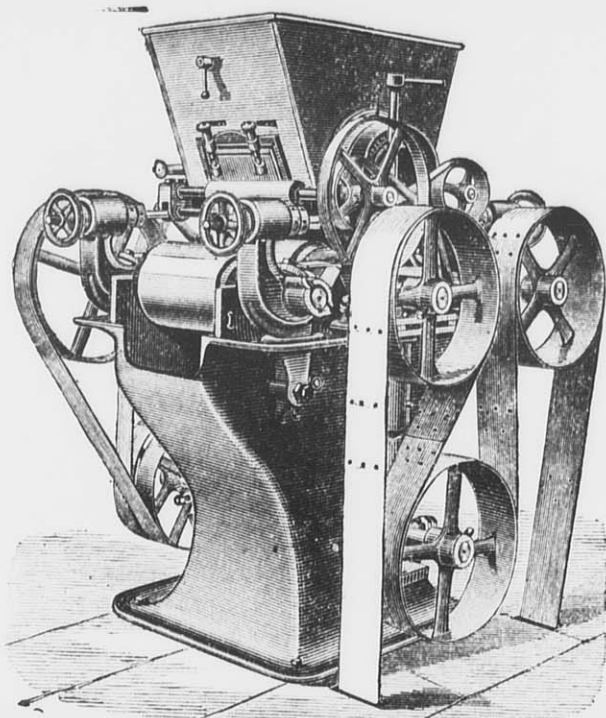
THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!



THE BEST ROLL

FOR

MIDDLINGS

IN THE

WORLD!

"AWARDED SPECIAL PREMIUMS."

OVER 6,000 OF THESE ROLLS IN USE

IN THIS COUNTRY AND EUROPE.

The Superiority of Porcelain over Chilled Iron for Reducing Middlings for Tailings is as under :

CHILLED IRON ROLLS, whether polished at first or scratched with fine grooves, soon become, through wear, smooth and glassy, and will only squeeze instead of grinding.

PORCELAIN presents a continual inherent sharpness, which no art can give to any other material in equal fineness and regularity, which enables it to act upon the smallest particles of flour and to separate them.

CHILLED IRON discolors the flour, by reason of the carbon that exudes from it, and also by its liability to rust.

PORCELAIN does NOT discolor the flour and is entirely indifferent to any and all chemical influences.

CHILLED IRON ROLLS are smooth and "cake" the meal; more especially is this the case on soft material.

PORCELAIN ROLLS possess a certain porosity, and no matter how finely ground, or how long they have been used, still re-

tain this granular and porous texture, and will reduce the middlings without "caking."

CHILLED IRON can be cut with steel.

PORCELAIN can ONLY be cut by the best black diamonds.

CHILLED IRON ROLLS require great power to reduce middlings to the proper fineness on account of their smooth surface.

PORCELAIN ROLLS will do the same amount of work, on account of the slight pressure required, and the gritty nature of the Porcelain, with one-half the power. The flour produced by Porcelain Rolls is sharper, whiter, stronger and more even than that produced by Iron Rolls.

No remarks need be made as to the superiority of Porcelain Rollers over Millstones, as it is a recognized fact by all. Porcelain Rollers are the only Rollers that will entirely supercede Millstones and Metal Rollers.

THESE MACHINES RECEIVED the FIRST PREMIUM!

At the late Millers' International Exhibition, Cincinnati.

Gold Medals at Nuremburg, 1876; Paris International Exhibition, 1878;

Little International Concours, 1879; First Gold Medal of the State, Berlin International Exhibition of the German Millers' Association, July, 1879; and Gold Medal Le Mans, 1880.

Full Instructions regarding the system of using Rolls in place of Stones given to parties purchasing. Address

EDW. P. ALLIS & CO., Sole Mfr's.
MILWAUKEE, WISCONSIN.

Mention this Paper when you write us.

COCKLE SEPARATOR MANUFACTURING CO., MILWAUKEE,

GENERAL MILL FURNISHERS

AND MANUFACTURERS OF

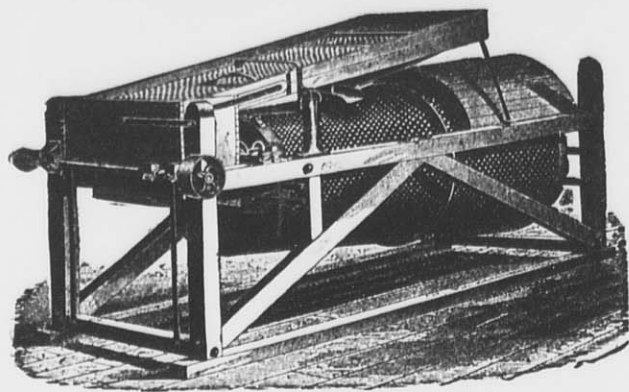
IMPROVED COCKLE SEPARATORS

(Kurth's Patent.) Also built in combination with

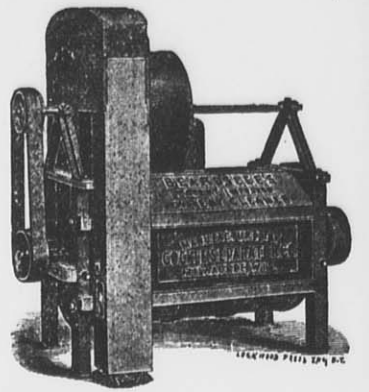
Richardson's Dustless Wheat Separators!

Also Sole Manufacturer of BEARDSLEE'S PAT. GRAIN CLEANER

We will contract to furnish entire Wheat Cleaning Machinery for mills, and guarantee the best results.



PLAIN COCKLE MACHINE.



BEARDSLEE'S WHEAT CLEANER.

Perforated Zinc at Bottom Figures.

Send for Illustrated Catalogue.

We GUARANTEE GREAT CAPACITY combined with GOOD QUALITY OF WORK. Any common Sieve will separate the cockle from wheat but to separate it WITHOUT WASTE is the GREATEST FEATURE of our Machine. A WASTEFUL machine is a DAILY LOSS OF MONEY in a mill. There is NO MACHINE IN THE MARKET which can stand comparison with ours.

Carbondale, Ill., Dec. 2, 1881.
Cockle Separator Mfg. Co., Milwaukee.

Gentlemen:—Replying to your late favor, would say that we can cheerfully recommend your Cockle Separator as doing all that you claim for it. We have tested ours thoroughly by this time and know whereof we speak. We would not think of doing without it, having tried it once, and can conscientiously vouch for its good work.

Yours respectfully,

BROWN & WINFREY.

Perrysville, Ind., Nov. 24, 1881.
Cockle Separator Mfg. Co., Milwaukee.

Sirs:—The combined machine I bought of you has been running about three weeks. It certainly does all you claim for it, and is the most perfect Separator that I have any knowledge of.

Very respectfully,

B. O. CARPENTER.

Hixton, Jackson Co., Wis., Dec. 30, '81
Cockle Separator Mfg. Co., Milwaukee.

Gents:—In answer to your inquiry of the 28th inst., I would say that the combined machine I bought of you last summer, works to my entire satisfaction.

Respectfully yours,

W. T. PRICE,

per D. G. THOMAS.

P. S.—I have been milling now for twenty-seven years, but never have I seen anything that will equal yours in cleaning wheat.

As an Oat Separator it is No. 1, and for Cockle it cannot be beat. I can take screenings and separate the cockle from it without wasting any of the small wheat. In my opinion every mill in the United States ought to have one, and if I were to build a mill I would have no other. I remain

Yours, etc.

D. G. THOMAS.

Minneapolis, Minn. Aug. 22, 1881.
Cockle Separator Mfg. Co.:

We have been using two of Beardslee's wheat cleaners, a scourer and finisher, for nearly two years, and are passing one hundred and fifty bushels per hour through them, one third more than rated capacity, and are not using any other cleaners, and consider our wheat as well cleaned as any in Minneapolis.

Yours truly,

CAHILL, FLETCHER & CO.

La Crosse, Wis., July 30, 1881.

Cockle Separator Mfg. Co., Milwaukee.

Gentlemen:—The Beardslee Grain Cleaner sent me about the middle of June has been in operation since that

time with very satisfactory results. I cannot see that it breaks the wheat or requires an unusual amount of power to run it.

Yours truly,

WILLIAM LISTMAN.

Milwaukee, Wis., Aug. 23, 1881.

Cockle Separator Mfg. Co.

Gentlemen:—The Beardslee's Grain Cleaners which we have purchased from you for our New Era and Milwaukee Mills give us the best of satisfaction. Experienced millers having seen the work done by the machine agree with us, that it cannot be beat. You are at liberty to use our names as a reference, and any party calling on us we will be pleased to show the machine in operation.

Yours truly,

NEW ERA MILLING CO.

Pott's Patent Automatic Feeder!

The best device for regulating the FEED ON ROLLER MILLS, PURIFIERS, and other machines requiring a regular feed, spread out the full width. Very cheap and simple. Sent on trial upon application. Write for circulars with illustrations. Perforated Zinc of all sizes at low rates. Send for Illustrated Catalogue.

STEEL CASTINGS

Works, CHESTER, PA.
[Mention this paper when you write us.]

FROM 1-4 to 10,000 LBS. WEIGHT.

True to pattern, sound and solid, of unequalled strength, toughness and durability. An invaluable substitute for forgings or cast iron requiring threefold strength. Gearing of all kinds, Shoes, Dies, Hammer-Heads, Cross-Heads for Locomotives, etc. 15,000 Crank Shafts and 10,000 Gear Wheels of this steel now running prove its superiority over all other steel castings. CRANK SHAFTS, CROSS-HEADS and GEARING, specialties. Circulars and price list free. Address

CHESTER STEEL CASTINGS CO.,

407 LIBERTY ST., PHILADELPHIA, U. S. A.

Genuine Dutch Anker, DU FOUR & CO'S, AND—Excelsior Bolting Cloths,

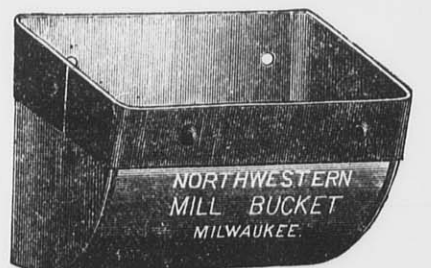
AT IMPORTERS LOWEST PRICES.

Sold by the piece, or cut and made up in any quantity desired. Plans of bolting complete for stone or roller mills. Address,

C. F. MILLER, Mansfield, Ohio.

Northwestern Mill Bucket Manufactory

310, 312, and 314 FLORIDA STREET.

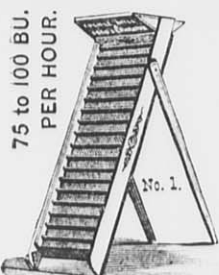


Is furnishing Mills and Elevators in all parts of the country with their superior BUCKETS. They are UNEQUALLED for their SHAPE, STRENGTH and CHEAPNESS.

Leather, Rubber, Canvas Belting and Bolts at lowest market rates. We have no traveling agents. Sample Buckets sent on application. Large orders will receive liberal discounts. Send for sample order.

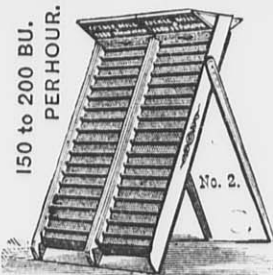
Address all inquiries and orders to
L. J. MUELLER, 197 Reed St., Milwaukee, Wis.
[Mention this paper when you write us.]

KING COCKLE MILL AND SEED SEPARATOR!



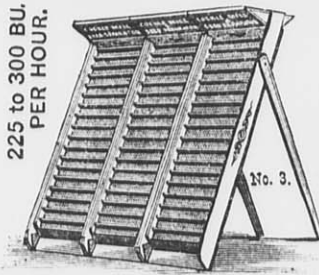
75 to 100 BU. PER HOUR.

No. 1.



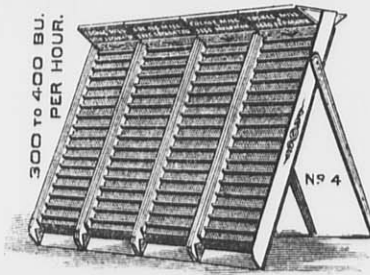
150 to 200 BU. PER HOUR.

No. 2.



225 to 300 BU. PER HOUR.

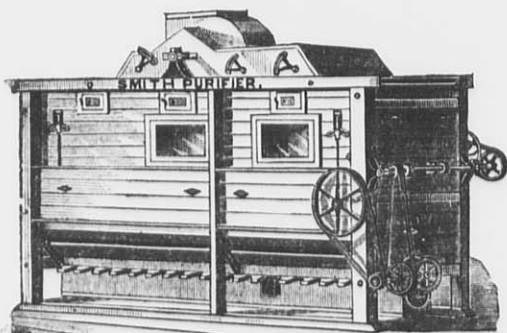
No. 3.



300 to 400 BU. PER HOUR.

No. 4.

Pat. November 9, 1880. Gives 25 Grades of work by Change of Elevation. No change of Screen. Requires no power. When used in Connection with Kurth Cockle Mill your cleaning capacity is more than Doubled. When used alone you have more Merit for the money than in any device yet invented. Write for circulars to La Du & King, Manufacturers, Rochester, Minnesota.



SIMPLE, DURABLE, ECONOMICAL. Cheaper than any other of EQUAL CAPACITY. Licensed under all patents owned by Consolidated Middlings Purifier Co. Eight sizes single and three sizes double machines.

THE LOCKWOOD MEDAL. "Awarded to the Geo. T. Smith Purifier, as the machine making greatest progress and utility in its application to the grain and milling interests, invented within the last ten years." Millers' International Exhibition, Cincinnati, Ohio, 1880.



THE GEO. T. SMITH MIDLINGS PURIFIER

Was awarded THE HIGHEST PRIZE ever offered for the competition of milling machinery — THE LOCKWOOD MEDAL — at the great Exposition. Competition and comparison with every other known Purifier only established it more firmly in the esteem and approval of millers and mill-owners.

It was UNANIMOUSLY awarded the FIRST PREMIUM in its class by a jury of five of the ablest, most successful and experienced mill-owners in the United States, men who represented the milling of every variety of wheat, and the use of all the latest and most approved methods of new process and gradual reduction milling.

Our sales during the Exposition aggregated OVER ONE HUNDRED MACHINES, for every part of the country and for work on all kinds of stock.

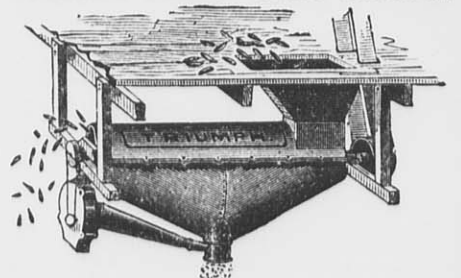
We invite particular attention to our SPECIAL machines, combining in one all the features of both air and sieve Purifiers, perfectly adapted to handle and purify the breaks of roller mills.

Write for descriptive circular and price list to the

GEO. T. SMITH MIDLINGS PURIFIER CO., Jackson, Mich., U. S. A.

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TRIUMPH POWER CORN SHELLER.



Shells and Cleans 2,000 Bushels Ears per Day.

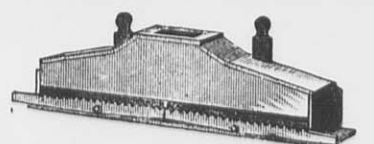
The Cheapest, Best, and most Simple Power Corn Sheller in use. Send for Circular and Price List.

Manufacturers of Steam Engines, Mill Builders and Mill Furnishers.

HULBERT & PAIGE, Painesville, Ohio.

[Mention this paper when you write us.]

The Perfect Feed Box.



It insures a perfectly even distribution of the middlings over the entire width of the cloth. Every miller will appreciate this. Fits all purifiers. Address,

CASE MANUFACTURING CO.,

COLUMBUS, OHIO.

W. E. CATLIN & CO., 68 LAKE ST., CHICAGO, ILL., AGENTS.

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Nickle FLOUR TESTERS mailed for 25c.